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This working conference was planned by the library profession and the medical profession in an effort to coordinate efforts of the users and distributors of medical information in the Pacific Northwest. Participants included representatives from the state medical societies and the state libraries, the two medical schools, and health related libraries. Topics covered at the conference were the interlibrary loan function, the information center function, quantitative aspects of regional medical library service, and the role of the National Library of Medicine. The main speakers' presentations as well as audience response and discussion are included in the proceedings. A list of participants is provided. (Author/CC)

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REGIONAL MEDICAL LIBRARY SERVICE IN THE PACIFIC NORTHWEST

PROCEEDINGS OF AN INVITATIONAL CONFERENCE

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Edited by
Gerald J. Oppenheimer

University of Washington Library
and School of Medicine

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REGIONAL MEDICAL LIBRARY SERVICE
IN THE PACIFIC NORTHWEST

Proceedings of an Invitational Conference
May 12 and 13, 1966
Henry Suzzallo Library
University of Washington

Edited by

Gerald J. Oppenheimer

1967

University of Washington

Seattle, Washington

INTRODUCTION

The decision to convene the Conference on Regional Medical Library Service in the Pacific Northwest resulted from the joining of forces by two groups each of which had long been concerned about the consequences of their professional activities on their communities and had expressed this concern through continued but separate action.

A tradition of vigorous library development has been a conspicuous part of life in the Pacific Northwest. The library scene is characterized by strong public library programs, aggressive leadership on the part of the state libraries, growth of regional library demonstration projects, and service by the major university libraries to those in need of their resources. The critical awareness of such facets of service engaged in by the profession had led in 1956 to a survey of library resources.[1] The survey represented one phase of self inspection, though perhaps not yet a full evaluation or a projection of things to come. A part of this inquiry was given over to an appraisal of the medical libraries in Washington, Oregon, Idaho, Montana, and British Columbia. The conclusions reached by the team of investigators left no doubt that there was no room for complacency, yet they were not, at the time, implemented by plans for action to eradicate some of the sources of dissatisfaction.

The medical profession as well was able to point to successes in the growth towards adequate health care of the citizens of the Pacific Northwest. For many years the University of Oregon Medical School has provided leadership in the training of physicians and in aiding needed research efforts. The School of Medicine of the University of Washington, having been founded immediately after World War II, has succeeded in a very few years in developing a major teaching and research center and, in collaboration with professional societies, in sustaining a spirit of service to the community in matters of health care.

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[1] Pacific Northwest Library Association. Library development project reports, ed. by Morton Kroll, Seattle, University of Washington Press, 1960, 1961, 4 v.

Since the early sixties federal legislation, passed or about to be approved, foreshadowed both the burden to be assumed by and the assistance which might be given to individuals and organizations in the area of health. In this same period the federal government acknowledged the role which libraries play pro bono publico, and in 1965, it singled out the special function of health sciences libraries by passing the Medical Library Assistance Act.

Early in 1966 the University of Washington School of Medicine assumed responsibility for the coordination of regional medical plans for Washington and Alaska. At this juncture a meeting of the minds occurred. To the Coordinator of Regional Medical Programs library service appeared to be an indispensable element in whatever plans for the benefit of the community were approved.

> We propose to make a study of an area somewhat remote from Seattle to determine whether physicians and other health personnel are aware of existing library services (i.e., the Medical Library of the University of Washington School of Medicine already provides bibliographic research and xeroxed reference material to physicians and other health personnel on request with reply by airmail), whether they use them and if so with what satisfaction. What do they regard as their needs in library services that are not currently being met?
>
> Should efforts be directed at improving local hospital libraries or attention focused primarily on developing a larger and more effective regional library, or should both aims be attempted? Subsequent meetings with librarians will allow us to determine how we can accomplish wider, quicker dissemination of requested material.[2]

To the library administration of the University it appeared necessary to find the surest way of meeting the new challenges and demands which could be expected to arise. Beyond this, a number of assumptions, expectations and doubts needed to be articulated more fully. Areas of ignorance regarding potential users of library service, their number, nature and habits, needed to be reduced. Questions requiring definition and answers concerned, e.g., the relationship of a state-funded university library operation to the demands from individuals and organizations not connected with the University, perhaps even from outside the state. Possible sources of support, most likely federal, needed to be identified which might render what was a felt moral obligation practically and legally possible.

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[2] University of Washington. School of Medicine. Application for regional medical program planning grant, 1966, p. 28-29. (Unpublished)

When the first discussions were held between the Library and the Coordinator of Regional Medical Programs ready agreement was reached that much was to be gained from convening a working conference having the unique characteristic of bringing together librarians, medical administrators and, particularly, practitioners--intended beneficiaries of medical library service--for the purpose of talking to each other, rather than being talked at. The organizers were under no illusion that as the result of this conference a blueprint for service could, in effect, be developed. They hoped, rather, that a beginning might be made of a continuing dialogue which would, after some hard work, reveal the significant questions and problems and point the way to means of providing answers and solutions.

It was decided to include representatives from the geographic area which librarians had come to regard as a natural service region. This then extended beyond the confines of the Coordinator's responsibility and included in addition to Washington and Alaska, the states of Idaho, Montana and Oregon and the Province of British Columbia. In order to preserve the character of a working conference invitations were limited to a representative from each of the state medical societies to voice the practitioners' concern and from each state library in recognition of the responsibility for state-wide service and networks. In addition, a representative each from the two medical schools and, from each state, one or two librarians connected with a health related library and, in one case, the chairman of a county medical society library committee were asked to be present.

In order to relate to the national scene, to learn of possibilities and probabilities of federal programs, and, hopefully, also to acquaint federal administrators with the concerns of a region, Dr. Martin M. Cummings, Director of the National Library of Medicine, was invited to attend.

To lead the discussion groups and present a closer look at problem areas we were fortunate in having as contributors Miss Gertrude Annan, Librarian of the New York Academy of Medicine, Miss Louise Darling, UCLA Biomedical Librarian and Miss Elizabeth Keenan, Reader Services Librarian, American Dental Association. Much of the success of the Conference is due to their thoughtful and effective presentation and leadership.

Gerald J. Oppenheimer

ACKNOWLEDGMENT

The costs of the Conference and of preparing and disseminating the Proceedings have been borne in part by the Washington-Alaska Regional Medical Program, Grant no. RM 00038-01, funded by the U.S. Public Health Service.

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MAY 12 AND 13, 1966

Conference on

REGIONAL MEDICAL LIBRARY SERVICE in the PACIFIC NORTHWEST

May 12 and 13, 1966
Henry Suzzallo Library
University of Washington

Cosponsored by the
University of Washington
Library and School of Medicine

Heightened activity by the health professions in research, training, practice, and care has greatly stimulated the demand for library and information services. In the Pacific Northwest these demands can be satisfied locally by a small number of medical libraries only. Recently passed federal legislation, recognizing these shortcomings on the national scene, has authorized the National Library of Medicine to support health efforts through establishment of MEDLARS centers and regional libraries. In order to provide adequate medical library service in the Pacific Northwest, it is necessary, therefore, to explore the needs of the user groups and of the reservoir libraries and the factors which would best meet the objectives of the parties involved, and to find ways and means to gather data which can serve as basis for a service network.

These are some of the questions which the Conference will consider:

What must be regarded as a minimum facility for furnishing basic information service?

What constitutes optimum use of a regional center?

What requirements will have to be satisfied to allow for such optimal service?

What services are to be extended to what types of clientele under what conditions?

What services do the members of the biomedical community in the region expect?

What service can a regional library reasonably expect to furnish?

Which factors must have guaranty of continued support?

The participants of the conference, from the states of Alaska, Idaho, Montana, Oregon, Washington and the Province of British Columbia, will be encouraged to formulate a plan to provide adequate regional medical library service for the Pacific Northwest or to propose suitable machinery which will develop such a plan without delay.

REGIONAL MEDICAL LIBRARY SERVICE in the PACIFIC NORTHWEST

PROGRAM

THURSDAY, MAY 12, 1966

8:45 a.m. REGISTRATION Conference Room, 4th Floor

9:00 WELCOME

9:15 OPENING REMARKS—Dr. Morton Kroll

9:45 INTERLIBRARY LOAN FUNCTION
(Group 1) Conference Room, Mezzanine
Present inadequacies in terms of speed of service and regional holdings . . . Desirable aids: Bibliographic, electronic . . . Depository arrangements . . . Regional network
Gertrude Annan, Speaker and Discussion Leader

INFORMATION CENTER FUNCTION
(Group 2) Conference Room, 4th Floor
MEDLARS and other means of information transmission . . .
Bibliographic searching . . . Types of question; subject areas and clientele . . . Local training . . . Cooperative arrangements . . . Electronic communication center
Louise Darling, Speaker and Discussion Leader

QUANTITATIVE ASPECTS OF REGIONAL MEDICAL LIBRARY SERVICE
(Group 3) Conference Room, 4th Floor
Determining demand for bibliographic and borrowing service . . . Size of staff and budget . . . Planning for growth
Elizabeth Keenan, Speaker and Discussion Leader

10:30 COFFEE BREAK

10:45 SEPARATE SESSIONS CONTINUED . . . DISCUSSION

11:45 LUNCHEON Student Union Building (HUB)

2:00 p.m. JOINT SESSION: REPORTS OF MORNING MEETINGS
Conference Room, 4th Floor

3:15 COFFEE BREAK

3:30 JOINT SESSION CONTINUED . . . DISCUSSION

4:30 END OF AFTERNOON SESSION

5:00 DINNER Faculty Dining Room, University Hospital, 9th Floor

FRIDAY, MAY 13, 1966

9:15 a.m. INTRODUCTION Conference Room, 4th Floor

9:30 ROLE OF THE NATIONAL LIBRARY OF MEDICINE
Nature of support . . . Need for feedback . . . Development of national network . . . Relationship to specialized information centers . . . . . . Links with other national libraries
Dr. Martin Cummings, Speaker and Discussion Leader

10:30 COFFEE BREAK

10:45 JOINT SESSION CONTINUED . . . DISCUSSION

11:45 SUMMARY AND STATEMENT OF PLAN OF ACTION

12:00 ADJOURN

2:00 p.m. INFORMAL MEETINGS

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May 12, 1966 MORNING SESSION

INTRODUCTION and WELCOME

- - - -

MR. MILCZEWSKI: May we assemble.

Dr. Thieme, the Vice President for Academic Affairs of the University, has come out of a staff meeting to be with us and to say a few words of welcome on behalf of the University. Not only is he the Vice President for Academic Affairs, but he is an anthropologist and I am sure is interested in how humans conduct themselves in affairs like this.

Dr. Thieme, without any further introduction, I will let you say your welcome.

DR. THIEME: I'm afraid I have to return to that staff meeting, too, so I'll not be able to participate in your meeting this morning.

I suppose one of the most difficult problems we all face, at least in university life, is to think about daily information handling, retrieval, and so forth. This morning on my way to work four cars were all crashed together on the Montlake Bridge, and I'm afraid that this brought home to me that we have even more pressing problems on the highway, I suppose, than we do in the library.

In any event, universities, as repositories of knowledge, and as places where scholars and research persons and teachers gather to push the frontiers of knowledge ahead, are, of necessity, institutions where information from the past, from distant lands, and from the present are all accumulated. As we all know, the point has been reached where one is capable of handling only a very small bit of this total volume of information if traditional methods are used and reliance is placed on traditional ways of educating oneself and keeping in touch with the word.

We are living by our wits these days and we'll continue to live by our wits in a highly competitive world where education and research are becoming instruments of national policy. As you know, the National Defense Education Act links defense and education together. Rightly or wrongly, it nevertheless is true, that institutions of higher education have become the frontiers of national defense and national policy, as well as the traditional instrument of transmitting information to the next generation and also advancing that knowledge and refining it.

Of course, the heart of this whole enterprise is the library, and just as on our highways, I suspect, in the library we've reached the point of congestion where we have to begin thinking of better ways to transmit knowledge. The particular area that you are dealing with is most exclusive of all because biology, following nuclear physics, has gone through just a quantum jump in the quality and the extent of knowledge, so that every advance from now on is going to have to be done in a much more sophisticated way than the first advances. And this requires a great deal of information, a great deal of knowledge, and a great deal of daily retrieval.

The business then of having a regional medical library service so that we can all help each other and, of course, help ourselves at the same time by concentrating our effort, seems to me to be a very worthy enterprise; and I am sure that anything that the University of Washington can do to further this will be done. I am glad the conference is here because we are very dedicated to this enterprise. So I welcome you to the campus and I wish you Godspeed in your meeting.

Thank you very much.

DR. MILCZEWSKI: Thank you, Dr. Thieme.

Dr. Robertson, who is the Associate Dean of the School of Medicine and Medical Director of the University Hospital, will be issuing a welcome on behalf of the Medical School tomorrow morning. Unfortunately, he is not able to be here today.

And now on behalf of the Library, I would like to welcome you. This conference, as many of you know, has been in the making for quite a long time; and we are most happy that finally it is taking place. We look forward with real, keen anticipation to the discussions that will take place and the results which we anticipate will come out of it, not particularly of this conference but of the thing which it symbolizes, and that is the attempt to develop a base for some regional service and mutual help.

We have some others here that you will be hearing later, and seeing, and talking with. We have Miss Annan, who is the librarian of the New York Academy of Medicine, a past president of the Medical Library Association. She began her career at a very wonderful library, the John Carter Brown Library, as assistant to Lawrence Wroth, and after that went to the New York Academy of Medicine and served in a variety of capacities beginning as rare book librarian, and since 1956 she has been the librarian. I need not dwell on her background or to tell you how distinguished a librarian she is, you all know that.

Dr. Cummings, who before he became librarian of the National Library of Medicine, was Chief of the Office of International Research, National Institutes of Health, again is a person who needs very little introduction, and we are very happy to have you here, Doctor.

Louise Darling is an old friend from California days. Berkeley and Los Angeles campuses are rivals, in a sense; but in the field that she represents, there really wasn't very much rivalry. We were glad to see the biomedical library develop quite rapidly under Miss Darling's direction. It is a model for us to strive for in our own special fields. She, too, is a past president of the Medical Library Association, more recently, in 1963/64. Our paths crossed in Latin America one summer when you were in Honduras and I was in Venezuela, I believe. I don't know where you have been since then.

Miss Keenan, who is the Reader Services Librarian of the American Dental Association began her career at Harvard in 1960 and in 1962 was Downstate Medical Center Librarian in Brooklyn. I had never thought of Brooklyn as being downstate.

We have come to the point where we are to have a real introduction to this conference by Dr. Morton Kroll, who is Associate Professor in the Graduate School of Public Affairs and the Department of Political Science at the University of Washington. Many of the librarians know that he was director of a two-year inquiry into library services and facilities in the Northwest, Idaho and Montana, Oregon, Washington, and British Columbia. He has a real interest in regional developments of other kinds, also, and I would now like to present Dr. Kroll.

DR. KROLL: Thank you very much. I couldn't help thinking that this P.N.L.A. survey began ten years ago this July. That makes me feel a little older. And I'm very happy to be here today. I don't exactly know what I can contribute. In a way I think it's presumptuous of me to comment at length about information services because I don't think that you have come here today to listen to me tell you your business, though as a political scientist, I'm quite used to having people tell me mine, not that I like it any more than you do. In a way, the great "out" of the political scientist is that he can play a philosopher king and call himself a professional while doing so, and it's a role in which the greater the distance from responsible action, the greater his prestige. You might keep that in mind.

But I want to comment briefly, or at least get my licks in, on a number of matters that are of concern to you and to me, one dealing with the problem of communications and information; secondly, I would like to offer some ideas or reflections concerning the development of the concept of a region; and third, I would like to take up the matter of determining and providing criteria of need for services, such as the services you will be talking about.

With regard to information, the problem of providing information, not only to scholars, but practitioners in a number of professional fields, is extremely complex, but is also, as I will try to point out, more difficult in implementation than in conceptualization. My perspective is obviously that of a student of the social sciences, a student increasingly overwhelmed, I might say, by the profusion of material in kind and in number in my own field, and the accelerating rate at which this material is produced.

There are some difficulties, too, that I would like to talk about that come to mind in reflecting on this process of designing and producing information. Whether these are applicable to the disciplines that compose what we commonly think of as medicine, I don't know, but I suspect they are.

The first dilemma arises from the determination of the most effective form in which the material should be put for transmission purposes. I think a difficulty arises from the fact that, as Dr. Thieme pointed out, our disciplines are constantly changing, changing in their content, changing in their relevance for the practitioner, their theoretical underpinnings, their designs; their parameters shift very rapidly. And the rate of change is increasing, as well.

Now how does one grasp a subject long enough to make it conveniently accessible to interested parties? How does one cope with change that must inevitably involve redesigning whole subjects, instituting various culling processes to get rid of the stuff that is no longer pertinent, and the important determinations that have to be made in that category.

What sorts of catalogues, indices, and other search devices are required to provide the maximum and most effective utilization? As you can see, I'm asking more questions than anyone is able to answer; but these are the questions that haunt people, I think, both at the sending and at the receiving end of this communications process.

What kind of accessibility is most effective and feasible and for whom? For research purposes, and in the social sciences, I should say, I am particularly sensitive to unnecessary duplication of effort. We are in very real trouble, it seems to me, when duplication is attributable to uncommunicated knowledge. And yet, I must say in the social sciences we have a good deal of this.

But how does one arrange materials and disciplines that are changing so rapidly? What kind of arrangements can be made so that one can easily shift gears and transfer bodies of knowledge from one category to another and perhaps even back again? These are questions to which we all must address ourselves, and I feel that the mechanical problem in this era of computers and other automated processes is not terribly difficult. Where we have our difficulties is in the area of imagination and the design stages, along with a kind of intellectual creativity. That should rank high, this capacity for creativity, in the status of any profession; and yet, unfortunately, it doesn't.

Now this brings me to a second consideration in this recital of dilemmas, and this is manpower. In any professional field, a working relationship between the producers and the distributors of information is a vital requirement for the advancement of knowledge. Now this is a cliché in a group of this kind, but in most of the academic disciplines and professional fields I know about, the value of this relationship is not recognized. In the social sciences we haven't advanced much beyond the bibliographic essay, and even this is a relatively rare item.

You people who are in science and technology are farther ahead but the question I pose, and the question that I think is rather bothersome, is whether the intellectual disciplines, the hard-core disciplines, if you will, are willing to recognize and grant full professional status to the man who is interested in the design and distribution of knowledge in the field. I am not so much concerned with people who are professionally trained as librarians, though they, too, are in short supply. But I'm concerned about research and clinically oriented people in the sciences who are willing to devote their professional careers to the sort of tasks we are considering. It seems to me that if it isn't already done, full recognition within the organizational system, let's say, of a university ought to be accorded such persons; positions ought to be allocated for them, and positions that are remunerative in money and in prestige. I think professional societies ought to provide recognition for the kind of theory building and research that is necessary for the development of this important role. In a way, I'm thinking of the advancement of knowledge and the requisites for it, no less. I should like to underscore this need because one is very sensitive to it, I think more so outside of the science and technology fields than within it. But I am sure that the problem exists across the board.

Now let me shift gears rapidly and turn to a few thoughts about regional concepts. In the organization and distribution of services, it is important, I think, to take a relativist view. Don't forget that in the eyes of the New York Times, particularly its sports section, we are now in the upper part of what is called the Far West. And a static idea of a region could create more problems than it solves. The agencies of the federal government, for example, use numerous, perhaps too numerous, notions of the Northwest. You take the way in which the Bureau of Reclamation, the Bureau of Land Management, the Internal Revenue Service, the Civil Service Regional Office, the defense agencies and the services within them, have their own ways of slicing the Northwest pies, and you get some idea of varying concepts of region.

The Pacific Northwest Library Association uses its division, which includes the four contiguous states, British Columbia, and I assume Alaska is in the fold now, is that correct? But economic regions, and these are of special interest to us, tend to cluster about metropolitan centers and some marked areas, in fact, fan out from centers normally outside the region. For example, the cities of the fertile crescent of the Snake River in southern Idaho look towards Salt Lake City, and those of eastern Montana look toward the Minneapolis-St. Paul metropolitan area. So that the service itself, or the complex of that service, including its clientele, should dictate the regional spread.

It would appear to me for the purposes of the kind of service you are considering at this meeting, that population centers play an important role in providing the core, or at least the main parts of the grid of a network, as well as the majority of the users. But it may be more practical to have those utilizing the service in eastern Montana plugged into a system that has its center in Minneapolis. And those in southern Oregon, for example, tie into the California Bay area. These are determinations which you people would have to make. I simply like to emphasize that the region has no meaning outside of the perspective that you provide, and this has to be related to your resources and your clientele. And the viability of the region is going to depend upon the effectiveness of that service.

One final point about regionalism, and this will almost seem to contradict what I have just said, it's all too easy to stress population centers; but the provision of certain types of service may necessitate certain imbalances. Accessibility to data, insofar as it can be provided, should refer to professional clientele, regardless of location. This will obviously make for certain diseconomies, for service rendered close to the source always costs less than when carried over long distances. Yet, where medical services or information services are concerned, diseconomy may be necessary, and it may have to be written into the total costs of the operation.

Now with regard to the determination of need, most service enterprises are, on the surface, clientele oriented. But on closer investigation it frequently turns out that the need has been articulated for the clientele by the providers of the service. In our society which is democratically and professionally oriented, we tend--I should say particularly in public administration --to stress the articulation of need as the basis for the provision of services.

But the process doesn't always work that way. The articulation of need is based on a precise understanding of the nature of that need and, most important, the knowledge that that need can be met or can be satisfied.

A physician who requires information and is not aware of services available to him, of services which will enable him to acquire this information, may compensate by arguing that he can make do with what is available to him. And this attitude, I should say, is not uncommon among professional groups.

Some years ago the former director of the library of the bar of the City of New York conducted an inquiry of law library facilities in connection with our P.N.L.A. library development project. He found that outside of Seattle and the state capitols of Oregon and Washington, and a very few law libraries connected with other institutions of higher learning, the law libraries as resources to practitioners in the states of the Pacific Northwest were poor to nonexistent. He wondered how in the world the practice of law could be maintained in areas of the region where no one seemed to look up anything.

He found that for all practical purposes law was not or was just barely practiced as he knew it in New York, and that various types of agreements had been made and were being made among lawyers in some communities which avoided the necessity for sound litigation. And the argument was, well, only one of the clients suffered under those circumstances. It was his impression that some of the attorneys wouldn't know a good law library if they saw one and wouldn't realize a good information service if it was presented to them.

He was equally convinced, and here is where the professional commitment comes out in all of us, that they ought to be taught to know and that a professional obligation existed to provide maximum information. And I'll leave the analogy of this to medical practice up to you. But the provision of any professional service, particularly one as sophisticated as those discussed in the several documents I've seen, requires the development of an effective communications device. Users have to be made as well as found, and the provision of a professional information service must also be seen as part of the continuing education of the profession. In this sense, a regional medical library service cannot be unrelated to the regional programs in continuing education in medicine.

One always has to settle for a little to a lot less than the idea, and it's fair in this context to ask how one goes about determining need among professional clientele. Two methods suggest themselves at this point, and I would like to comment on these two.

A careful survey could be made by means of interviews, but it should be done by a professional survey research group, by people who are skilled at eliciting the kind of data that will be important in the development of a service such as the one that we will be talking about in this conference.

One has to ascertain need that may not, in light of what I have just said, be easily articulated. This may require indirect probing by skilled interviewers and a careful analysis of the data. It might be difficult to impossible, for example, even to ascertain if the service would be utilized as extended, as the potential user may have no idea what that service is really like.

Further, his utilization of the service may be contingent upon the professional social situation and the interrelations within his community. To put it rather candidly, it may be the "in" thing or not the "in" thing to be current on one's knowledge of a field.

In this context a lot should be known about the interaction of physicians in communities throughout the region. How they view their profession; what their professional expectations and anticipations are with regard to their own performance; and the extent to which they are influenced by those colleagues with whom they have closest contact in clinics, hospitals, and so on. Obviously, the more that is known about how the physician lives and works, or any professional person for that matter, the more clues we have that enable us to provide effective reinforcing services.

A second method of determining need would center about the development of a pilot project or several pilot projects. In a service such as the one contemplated by you people, this might prove too expensive; I don't really know. But the experiences derived from pilot programs could in the long run provide a great deal of information and perhaps result in large savings. Any pilot program is based on the fact that one can find truly representative samples of communities or varieties of sample communities.

This might pose a difficulty in a region as sparsely populated as the Pacific Northwest, no matter how we slice it. But one could, in a thoroughgoing pilot program, ascertain the services most needed, the most efficient methods for providing these services, the kind of orienting and continuing education program needed to keep the idea of accessibility before the clientele; and also, one would know something about the problems incurred in relation to time, cost, manpower, utilization of resources, in providing this service. And finally one could get and study the kind of feedback that might be expected from the provision of this service.

In other words, it isn't generally adequate to proffer a service of the type we are talking about without doing the necessary groundwork; and whatever it is that constitutes the groundwork may require very careful definition based on research and experimentation.

I don't know that I have contributed very much to the discussions you will be having today and tomorrow. I have tried to point to a few, and a very few, perspectives that a social scientist and his colleagues might come by. You are embarked on a venture here, I am certain, the success of which will benefit a great many groups and disciplines, both within and outside the formal confines of medicine. Other branches of knowledge will certainly have to face up to the kinds of problems you are tackling here now.

I thank you very much for listening to me and I wish you well in your conference.

MR. MILCZEWSKI: Thank you, Dr. Kroll. You have given us a good background against which to discuss the other papers that are to be presented and to carry on the kind of discussions that will go around outside of the formally organized group conferences.

We expect that this will really be a significant conference, and we are grateful to you for introducing it so well. Thank you.

Group 1: INTERLIBRARY LOAN FUNCTION

Gertrude L. Annan

MISS ANNAN: Although the New York Academy of Medicine has long served as a source collection for other libraries, for physicians, scientists, students and the public, its use has radically changed in the past twenty-five years. As early as 1940 interlibrary loans had become a problem, reaching a total of over 2,600 volumes. During that year the interlibrary loan code was introduced, and the total dropped by several hundred. The second world war brought a further reduction, and during one year in the early nineteen fifties, there were fewer than 1,000. Ten years later, there were more than ten times as many. At the same time, the number of readers coming in person to the library declined by 50 per cent and has remained at that level. The character of the readers has greatly changed, with a large increase in student use. In fact more than a fifth are students who are not dental, nursing or medical. It is obvious that since the war the busy physician and scientist prefers that the books come to him, not he to the books.

We were overburdened by increased requests, and at the National Library of Medicine the situation was critical. As all of you know, the decision was made that it was more practical to provide free photocopy instead of sending the volumes, this to be done at the discretion of the library. The new policy brought forth an unprecedented deluge, with many requests for loans of common material in the expectation of getting free copies. In February of 1959 I was in Washington and discussed the matter with Estelle Brodman, then Head of Readers' Services, and Marie Harvin, in charge of interlibrary loans. They were deeply concerned lest the goose which laid the golden egg might be done away with. At the meeting of the Medical Library Association in Toronto that year, Miss Harvin spoke at a session on medical library cooperation, and Dr. Rogers clarified the stand newly taken by NLM that medical libraries were expected to look first to local sources before turning to NLM. A few years ago Mrs. Kovacs, Librarian of the Downstate Medical Library in Brooklyn, New York, announced at one of our regional group meetings that that library would not limit the number of loans to other libraries. Before very long, however, she was forced to advise some of the local librarians that they could not borrow so many items at once. More recently the Countway Library in June of '65 offered free photocopy, but by Labor Day of the same year had such increased demands that this expensive luxury had to be curtailed. Mr. Martin, the Librarian of the National Institutes of Health, told me two years ago that in the previous year his library had done half the amount of photocopying for his readers as NLM did for the whole country.

It seems clear that if photocopying is offered by any library without charge, the number of requests will be so great that we must be prepared with carefully thought out regulations. Only in this way may we hope to fill our obligations effectively. I must point out, too, that any library which receives funds for participating in a regional scheme must be prepared to feel a real commitment for this service. At the Academy our work each morning is geared to cope with the great influx of requests for interlibrary loan and photoduplication which come through the mail, or with the daily delivery service of the Medical Library Center. And our telephones bring a steady stream of questions, in great part from other libraries. As a young man in our Reference Department said to me recently, "We are a library's library--we spend most of our time working for other libraries."

This burden has brought a number of problems which may be pertinent to our discussion today. For no matter how sophisticated a system is developed, we must for the foreseeable future meet the very elementary difficulties posed by human error, human demands and sometimes human whimsy. Some of the steps taken by the Academy may be of interest.

Our first step was for us the most important. In April, 1958, a group of about 100 administrators and librarians met at the Academy to discuss the possibility of cooperatively meeting some of the problems which were overwhelming us all. The result, as you know, was the establishment of the Medical Library Center of New York, which is performing valuable services for us. In fact, it is no exaggeration to say that the Academy Library could not at this time function efficiently without it. Although new stacks had been added in 1953, planned to give sufficient space for 25 years, crowded shelves resulted in piles of volumes on the floor in the aisles, and a slow and faulty stack service with all too many call slips marked "Not on shelf" or "Temporarily missing." By transferring less used materials (so far 1,600 volumes, 100,000 theses) to the Center where they are available in twenty-four hours or less, we are now able to have volumes in our own stacks shelved properly and serviced promptly. The journals considered "less used" were old runs of pharmacy, nursing and library journals. Their transfer does not weaken our collection as a major resource library. Daily delivery service among the participating libraries means that each morning volumes from the Academy, the Center and other source collections are picked up and taken to the borrowers. The Center has also provided us with a union catalog of periodicals which is being computerized and will be available in book form and kept up-to-date continually. The union catalog not only shows where journals may be located but will serve as a source for improving the acquisitions of current periodicals in the city. At this time of great proliferation and increasing expenditures, this is especially important. In our opinion a large metropolitan area should possess all current periodicals whose contents are indexed and therefore requested.

You may be interested in other points relative to the proliferation of periodicals. In 1958 Mrs. Bready, then Head of our Periodicals Department, was concerned because there were some 176 journals indexed in the Current List of Medical Periodicals not being received by the Academy. We had formerly tried to acquire all medical publications and in fact in 1950 took the same number of journals as the National Library of Medicine. We sent Mrs. Bready's list of journals to the libraries now a part of the Center to check their holdings, and eventually by cooperative acquisition brought that number from 176 to about 75. The holdings of current periodicals are especially important in interlibrary loans. The Academy's feeling of obligation toward maintaining a substantial collection for the area has been difficult to fulfill. In 1958 we regularly received 2,767; in 1965, 4,330. Despite this increase, the Union Catalog shows that there are approximately 400 journals indexed in Index Medicus not being received by any library in the New York area.

During the year I was President of MLA I made a habit of early attendance which offered a headstart in getting to some of the mail before the Library opened. I became so fascinated with the many interlibrary loan requests and photoduplication orders from different types of libraries and industries and from various geographical areas that it seemed obvious that a study of interlibrary loans in the heavily concentrated New York region would be of considerable interest. Although we keep track of requests for materials we are asked for and cannot supply, we were interested in determining just how much and what kind of material was sought and not found at all in the metropolitan area. Accordingly we proposed to study in depth interlibrary loans among the medical libraries of New York State, New Jersey, the College of Physicians of Philadelphia, and a few libraries of southern Connecticut. First a questionnaire went forth asking participation and a favorable response ensued. From this we learned that in one year 278 libraries received requests for more than 70,000 items and actually loaned 60,000. Of these 217 libraries agreed to notify the survey of all requests for a year's duration. The final study is now ready to be submitted to the Health Research Council of New York which funded the project, and the analysis will soon be available. The study covers photoduplication requests as well as loans. I had hoped to have the finished study at hand to consult,* but delays because of computer problems prevented prompt analysis. Also, the very amount proved overwhelming and had to be limited in the time available. At this time I can express only a few generalities. The requests made to the larger libraries, those which are members of the Center, were for very common material, as most user studies show. However, requests made by the larger libraries were for foreign or unusual material. Industry is a predominant user of the medical society libraries, and is also apt to request the more common journals. As industry frequently makes requests from libraries for materials completely outside their scope, the materials cited as not available in the libraries are not always desirable acquisitions. For this meeting today the most pertinent information in the study are the two lists of 300 journals requested of or by the participating libraries. Obviously the library which can maintain a collection of these highly used journals will seldom have to make requests of the regional library. Medical schools can certainly maintain such a collection and local hospitals can surely depend upon local medical collections. This would greatly lessen demands made upon the regional collection. I recommend that you examine the results of this analysis.

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*This study has now been published: Ash, L. and Bruette, V. Interlibrary request and loan transactions among medical libraries of the Greater New York area. New York, 1966. (Available from the New York Academy of Medicine Library. $5.00)

The establishment of the Center and the interlibrary loan study are important steps in our plans for serving the community, but there are also small points which must be mentioned, must be emphasized in considering definite policies for making full use of our library materials. First, by what means should copy be supplied? If by photocopy, we must not minimize the damage to the volumes themselves. A library which expects its books to be available to future generations cannot but be appalled by the damage done by xerox. I am surprised that in all of the criticism publishers have levelled at the undue use of photocopy, none seems to have become aware of the fact that in the murdering xerox machine they have an excellent ally. At the Academy we are very cautious indeed in letting this quite terrible machine devour the old, the fragile and the much used texts. Microfilm is less destructive, but overuse by filming is a danger as well. I received two long and concerned letters on this subject, one from Dr. John Blake, the other from Mr. Samuel Waters, both of the National Library of Medicine. They are so important, I shall quote them in full.* First Dr. Blake's letter:

> The mechanics of our interlibrary loan system involve, for current journals, first microfilming the requested article; second, printing hard copy on the CopyFlo machine, which employs a xerographic process to print from microfilm rather than life-size from the original; and finally, assembling and mailing the copy, but throwing away the film. There are some variations. Material which is too large to put on the cameras at our fixed 11x reduction is usually handled on the Xerox 914. We do have some journals on film, and these films are used, rather than the original, to produce the ILL photocopy. However, this filming has been done primarily for preservation of disintegrating originals, and does not include the high-use journals, by and large, but rather the opposite. I am informed that we did once try a policy of creating in advance film files of high use journals which we would use to fill loans, but that it was abandoned some time before I joined the Library in 1961 because of the high cost of recovery from the file and printing on photosensitive paper.
>
> Our system therefore involves, generally speaking, rephotographing the article each time it is requested. There is less likelihood of damage from photographing on microfilm than copying on the 914, but it is nevertheless destructive if repeated too often. You should see what has happened to, for example, our copy of Fleming's original article on penicillin: it has been virtually filmed out of existence, although the rest of the volume remains intact.

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*Quoted by permission.

I share your concern for the destructive results of our present system in its long-term operation, as well as the concern I know you have for material that is disintegrating because of age and poor paper. I am happy to report that the Library administration is very much concerned, and we are increasing our microfilm preservation program substantially. Subject to availability of funds, it will be further expanded in the future. At the same time we are also beginning to think seriously about other methods of handling the interlibrary loan system, and any advice that I may give will certainly be directed toward emphasizing the Library's long-term archival responsibility for preserving the literature.

In sum:

(1) Direct xerography is destructive.

(2) Microfilming is also destructive, though less so than direct xerography.

(3) The implications of present day photocopying technology are very serious for permanent preservation of the material. It is a problem that demands consideration.

Incidentally, with occasional exceptions, books in the History of Medicine collection are filmed once only. The camera negative is used only for preparation of additional films which in turn are used to fulfill interlibrary loan and other service requirements.

And now Mr. Waters.

I would like to amplify Dr. Blake's remarks with respect to NLM's rapidly developing plans for microfilming both for preservation and interlibrary loan fulfillment purposes.

First, I can assure you that a substantial program for preservation of deteriorated material through microfilming is now under way. This fiscal year we hope to film one million pages in the Library from older journals. We have also awarded contracts for filming one million pages to each of two commercial microfilm firms. We hope to expand this program greatly, since we have a backlog of an estimated 37 million pages of deteriorated* material in our collections. Pending reduction in cost and improvement of techniques, however, we have no plans to use deacidification techniques to arrest deterioration of original materials.

When asked for interlibrary loans from the relatively small amount of materials already filmed for our preservation program, we are creating microfilm copies through the Kalvar process for loan to those libraries we believe are likely to have microfilm readers available.

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*Inability to survive a single fold has been used as a criterion of "deterioration."

Our long range plans for a graphic image storage and retrieval program may take one or both of the following courses:

a) Preparation upon demand of microfilm copies of long runs of journal titles, for sale to libraries wishing to build their resources. These microfilm copies could be used either for viewing or for production of hard copy on reader-printers.

b) Creation of continuously updated "core" microform files for distribution as units to regional libraries. Presumably, we would also develop and make available to these libraries hardware with which they could produce hard copy from the "core" files, for fulfillment of a large part of the ILL requests they receive from smaller libraries in their area. For example, we might envision a file covering the most recent five years of all Index Medicus journals. Demand searches of MEDLARS tapes at NLM or the regional libraries would produce lists of citations relevant to a given request. The requester might then check items on the list which he desired to scan. Automatic systems would produce these for viewing, and hard copy of selected items could then be produced automatically or semi-automatically from the "core" microform file.

Both of the above courses of action introduce requirements for legibility after several generations of copy production: from the original article through an archival camera negative, a printing master, a distribution microform copy, and finally to hard copy. A National Bureau of Standards team is now studying this problem for NLM and has arrived at tentative resolution and density specifications for the microfilm which should enable us to obtain legible copy at the end of this chain. It is not as easy to produce film to these specifications as might be assumed in view of the relatively long history and widespread use of microfilm. We hope that in a short time our specifications will be firmed up and we will have good evidence of commercial ability to produce film to these specifications. The NBS team is continuing research and development work towards a graphic image system for NLM, including the hardware mentioned above.

In addition to the physical problems of microfilm production, NLM is aware of problems relating to distribution of the film, including those of copyright clearance. Several commercial firms have expressed an interest in microfilming and distributing those medical titles for which there is an appreciable demand. It is our hope that any such filming will be done to the specifications NBS believes are required for the purposes of the graphic image program, in order to avoid duplication of filming.

As can be seen from the above, our plans are still fluid, but actions are being taken to arrive at our common goal of fulfilling interlibrary loan requests while avoiding destructive repetitive copying of original materials.

The preservation and maintenance of library materials is an important part of interlibrary loans, as fragile volumes, those in poor repair and those wrongly shelved are unavailable for readers. At the Academy we have found it necessary to have the older material in a more remote area and we are spending much time trying to amalgamate collections of materials from 1800 through 1950. The constant battle to maintain these in good condition is necessary if we are to honor requests for both interlibrary loans and photoduplication. In general we do not allow volumes through 1850 to be xeroxed without first being examined by the Librarian for valuable historical contributions are in that period. The fragile paper of the years from 1860 on is of equal concern, and any volume which is in poor condition is automatically examined before approval for either lending or photocopy.

The time may come when new methods can help solve our problems and facilitate rapid transmission of copy. For a large area such as the Pacific Northwest there are systems which can link distant libraries. Teletype* and Telex should be explored. Telefacsimile, such as LDX, is of interest. Unfortunately it depends upon the use of xerox. Perhaps some system using microfiche will prove satisfactory, since microfiche permits the examination of individual issues of journals. If high use journals were available on microfiche and easy transmission practical, this might point toward an effective procedure. Advances in communications will certainly bring other methods of transmission. Pioneering efforts are being made on various levels. At a recent meeting in New York, a system was described that connects New York State libraries. One librarian pointed out a present limitation, for the medical school library was given computer time only at 4 a.m. In some cases computer time is available only once a week. However, these new developments will certainly revolutionize communications between libraries. Those of you who have not seen the volume called INTREX[1] will surely find it absorbing.

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*A recent article by L. J. van der Wolk, Teletype and the telecode for libraries, UNESCO bulletin for libraries, 20: 170-176, July-August 1966.

[1] Overhage, C. F. J. and Harman, R. J., eds., INTREX; report of a planning conference on information transfer experiments, September 3, 1965. Cambridge, Mass., M.I.T. Press, c 1965.

Even with such new methods, the major problems will remain and we must continue with some of our current methods. You are all familiar with the Orr-Pings report and should consider its important recommendations. There is one, however, I would take issue with and that is that interlibrary loans may be requested by telephone, as anyone who had occasion to be in our telephone reference room for very long would surely agree. We do not allow telephone requests for interlibrary loan or photocopy except in an emergency. We have three telephones for reference plus one in the office of the head of Reference, plus one for current periodicals, and one for the history of medicine. Occasionally, some come to my telephone or that of the Associate Librarian. Even so, the operator advises that we should have two more for reference, but this we cannot do as we do not have the staff to answer them. We could not therefore cope with a mass assault of interlibrary loan requests by telephone. Nor would we want to in any case, for such requests must be in black and white. The burden of accuracy must be shared by the requesting library, and teletype or telex should replace the telephone. Many examples may be cited. No matter how carefully requests are checked, there is still a large margin of error. Last September when I had to address a group of medical writers on library use I asked the reference department to keep an account of incorrect references for interlibrary loan and photoduplication coming through the mail in one week's time. I was staggered. And these were not from untrained workers in hospital libraries, but some were from medical school libraries with highly trained staffs of great responsibility.

What then should be our stipulations?

1. requests must not be made by telephone
2. unless requests come by teletype or telex, A.L.A. forms should be used for interlibrary loan or photoduplication
3. journal titles must not be abbreviated
4. requests must have authorized signatures
5. the requesting library must have some understanding of the problems involved.

These I know sound too elementary to mention today, but they are of utmost importance in saving staff time and facilitating services. The paper work forced on our staff became an overpowering burden and delayed the processing of requests. Although we expect to spend time identifying needed texts for librarians who do not have our reference sources to consult, we do try to persuade them to give as much information as possible. Our photoduplication orders are often unbelievably inaccurate, coming as they frequently do from non-library sources, and the worst difficulty arises from incomprehensible abbreviations.

Examples

Abbreviation: "U. Gesch.," author of article: Haut, Z.
Reference wanted: Zeitschrift für Haut- und Geschlechtskrankheiten

Abbreviation: "Biol. med.," second author, Yale, J.
Reference wanted: Yale Journal of Biology and Medicine

Even A.L.A. request forms for interlibrary loans and photoduplication are often misunderstood and we have had to provide explanations for the varied institutions which depend on our collection. These samples may be of help to some of you. It may seem elementary but we have found that such advice is required. The need is great for an understanding among the participating libraries. The more accurate and precise the requests, the better the service. This is the chief obligation of the borrowing library. A flood of doubtful citations is an expensive waste of the lender's time and delays service to all, and service to the area is the obligation of the resource library.

A most necessary step would be to hold a meeting of the librarians representing all the libraries in any regional system to emphasize the problems of the source library in coping with a constant flux of demands as well as to stress the responsibility of requesting libraries in providing accurate and complete citations. There must be understanding on all sides that service to those outside of a library depends for its speed and effectiveness upon the demands made upon it. This is a simple message, but mutual understanding may result from its acceptance. Without it the source library may face a period of serious difficulty.

This great area of the Pacific Northwest differs so radically from the New York Metropolitan region that any account of our problems can be only of very limited help in solving yours. However, a few sentences from the conclusion of the Ash-Bruette report should be of interest to all libraries facing the challenge of the demands for interlibrary loan.

"We think that the evidence compiled in the foregoing analysis of the records of cooperating medical and paramedical libraries in the megalopolis spread from Southern Connecticut to Philadelphia is sufficient presentation of one of the costliest programs that libraries engage in, and we believe that the growing burden of the interlibrary loan function is one that must be relieved. Not only are direct costs involved, but mounting hidden costs--such as time, equipment, and personnel concerned with the paper work, the verification, the searching, pulling books, photocopying, the supplies, record keeping, and mailing at both ends of the loan--have become excessive, a fact that will be revealed by even superficial investigation.

"Traditionally though, libraries in the United States and the librarians who provide their services have felt an obligation to cooperate with one another in order to supplement the necessary information needs of the community, whether that community is a set of local, regional, or even national users, or types of interdependent libraries. We have seen this kind of cooperation in action, so to speak, among all kinds of special libraries and in the generous lending programs of the Library of Congress and our national libraries of medicine and agriculture. In this study we have seen it working among a large and sensitive group of libraries that are essentially bound in one way or another to the development and preservation of health and other related areas of human welfare.

"Administrators of these libraries, however, are taking a second look at library costs--as their librarians should--and they have begun to consider the inappropriateness of certain hiding if not hidden allocations in the library budget which cover and pay for interlibrary loan services and other seemingly extraneous charges. What will they find?"

Discussion

Q: Concerning book damage, we can confirm your experience in that we have had quite a bit of damage to periodical volumes from continued use. We have also had to replace volumes which were loaned and filmed by another library and returned to us broken.

MISS ANNAN: This is a very real problem and we appreciate those librarians who write to us and say, "We would like to borrow a book and film it or xerox it. Do we have your permission?" This is a great courtesy when so much damage can be done. We carefully examine the volume before making a decision.

Q: Can you speak in principle or in general? What do you think in the future is to be the role of what I would call the private institution such as the private medical school library?

MISS ANNAN: Such libraries are often accustomed to serving only their own people. In some cases it will be a real hardship if they are expected to serve the community as well because the demands are often varied and great, and take time away from the needs of their own group. For most, their role will probably remain as it is today, leaving the other services to regional libraries, the function, formerly, of the disappearing society library.

Q: One of the important things we need to know is who the users are and why they want to use our facilities. This is very difficult to know.

MISS ANNAN: We have had a number of user surveys and have found there are very few who do not have a legitimate reason for using the library.

Q: Do you have details of them?

MISS ANNAN: In March, 1965, 55.65 per cent of our readers related to the health professions, whose use does not need explanation. Of these only 15 per cent were our own Fellows. Students other than medical, dental or nursing amounted to 21.35 per cent. About 14 per cent were from other professions: engineers, advertising men, lawyers, professors, teachers, artists, musicians, accountants, editors, writers, newspapermen, philologists, historians. They make good use of our library. Dr. Thieme this morning told me he used our library a good deal when he was in New York, and he is an anthropologist. About 10 per cent of our readers are laity. This category includes those who stated they were doing research but did not further identify themselves. Some were policemen reading about narcotics. One was a graphologist. We find on the whole we have very few of the curious laymen coming to read up about their diseases. For them there is a considerable collection of books especially written for the laymen. Some of our Fellows send their patients for such material.

For users outside the library, you will be interested again in examining the survey: Interlibrary request and loan transactions among medical libraries of the Greater New York area. The most astonishing information relates to the use by industry. This confirms the recent Libri article stating that the National Referral Service at the Library of Congress reported 40 per cent of requests for information coming from industry.

Q: One thing I was curious about, in something you distributed relating to the cost of photocopying, the prices vary so. Does it depend upon the quantity of one request?

MISS ANNAN: Our charges depend on the amount and the type of photocopy. For example, we acquired a Polaroid camera last year, and so obtained price lists from the New York Public Library, the Library of Congress and the National Library of Medicine. Then we computed our own costs for time and materials and decided upon prices comparable to all, so that we are not too high or too low.

Q: Do you photoduplicate a whole journal?

MISS ANNAN: We do not. We comply insofar as possible with copyright regulations. When it is monographic material which states that nothing shall be copied from it without getting a release, we insist upon it. Sometimes our readers get angry, like a lawyer who said that at a law library he was allowed to go to the xerox machine and do it for himself. He said, "If you will allow me, I will do it and you will not be held responsible." He was not permitted.

We have copies of letters from Lippincott and other publishers which were sent to those who complained about "those librarians at the Academy of Medicine," and the publishers stated that the Academy is quite correct in insisting upon getting a release. "We are glad to provide you with it but we expect the library to maintain this attitude." And we do! We adhere to fair copy use. We do not allow many copies to be made. We are often severely criticized by our readers but we insist upon maintaining this standard.

Q: Do you charge for pulling the reference and an additional thirty cents for a xerox page, or just thirty cents total?

MISS ANNAN: No, thirty cents total. We don't have any other charge. Xerox copies for people within the library, when no billing is necessary, are 25 cents, but for photoduplication orders that must be mailed there is also a handling charge. We also found that for the Polaroid camera we have to have some quite high minimum charges because unless you can batch requests, schedule them on certain days and fill a number of orders, you have to use the entire film. So we have to set the minimum for rush jobs at six or eight dollars, or whatever the film covered costs.

Q: May I change the subject and go to another thing which is interesting. This was your reference to what seemed to me to be a decline of medical society libraries. I really don't know what the state of medical society libraries is in this region. King County Medical Society is probably one of the better ones in the whole region. Do you see a declining interest or ability to support libraries?

MISS ANNAN: In the East the great collections have been made by the medical societies such as the College of Physicians of Philadelphia, Boston Medical Library, Kings County Society in Brooklyn, and the Academy in New York City. The tremendous cost of maintaining such collections has meant the disappearance of some society medical libraries, both large and small. The Boston Medical Library is now part of the Countway and the Kings County in Brooklyn is merging with the Downstate Medical Center, State University of New York. In some instances this has meant a community loss. If the medical society library is absorbed by a school library thirty miles distant, it means that the local physicians and students are unable to easily find the material they need.

Q: We are thinking about a regional medical library service for the community and we want to make sure that we are paying attention to the needs of all, not just a few.

Q: Should this library be a hospital or a society library?

MISS ANNAN: It doesn't make any difference who does it as long as all needs are taken care of, but I know that it will be more difficult for some medical school libraries to take care of community needs.

Q: That is very true. The university offers continuing courses and lots of conferences, but when you really get down to it, the information you need you still get from the library. It is not courses and other things like that. And I am glad you raised this issue.

Q: Actually, in my state we only have one good medical library outside the university, and that is the King County Medical Society Library.

Q: I would agree.

Q: There are small ones elsewhere in Tacoma and Spokane.

Q: Theoretically, we have a medical library too, but I don't consider it a good one. I mean the State Library.

Q: I would be interested to know how you would separate the function of the small medical society library from the larger library like your own? For example, what function can the King County Medical Society Library serve while there is a larger regional library that is going to be working with them? How do they limit what they offer?

MISS ANNAN: I suppose in different communities the problems are different, and while I don't know about the services of the Society library here, certainly arrangements can be made for any society library to continue serving the group that a larger library might not wish to. But I don't think that who does it is as important as how it is to be done and worked out.

Q: I think it will be relatively easy to work out an arrangement for the King County Medical Society so that we can look to them, but it is going to be much more difficult with a place like Tacoma or a small medical society in Idaho, and this bothers me.

MISS ANNAN: Perhaps some of them don't need to. Other arrangements may be made. In Brooklyn, for example, the merger of Downstate and Kings County is a very good idea because Downstate is a State library and must be geared to serve everybody. There is no problem there. I know that many medical school libraries are very active in sending loans all over the country and some take particular care of their own area such as in Omaha, Nebraska; Madison, Wisconsin; Birmingham, Alabama. They are accustomed to doing this. But in some areas there will be difficulties.

Q: I am Dr. Bowman. I would like to say just a word about our problems in Montana which are somewhat different from those in Washington. In Billings, for example, which is a town of about 65,000, we have several small hospital libraries which are not very adequate and at the Billings Clinic, of which I am a member, we have a fairly good library with perhaps 100 different journals.

We are now going to get a county medical society library and this will cover the medical journals which most people might reasonably want to read. But then, what we need is a regional center or the services of the National Library of Medicine or of your Library to get the foreign language journals and the more abstruse publications that we might want once every several years.

But I think we could probably, under our own steam, take care of the frequently used journals and have them available. What we need are the rare ones and we need to have them reasonably handy, when we need them. We might not need them for years.

MISS ANNAN: I think perhaps the journals of high use are really the greatest problems. They should be easily available, perhaps in multiple copies so that only the unusual journals need be requested on loan. The less used journals need be in only one source collection. For many of the rarest journals, reliance on the National Library of Medicine would still be expected.

Q: In the Seattle area most of the major hospitals have the high use journals available but the problem is still the service and accessibility which faces the practicing physician.

Q: Where would one find translating services for medical journals?

MISS ANNAN: The Academy used to have what was called a Bibliographical Department which, for a fee, did translations, bibliographies, editing, etc. The service was started as a convenience for the medical profession but it was used more and more by industry, and translations became more difficult with requests for exotic languages which our staff could not supply. On the other hand, few wanted German and French translations, and we had to find busy work for those in the department. We closed the department in 1957 and have since then maintained a file [illegible] translators, editors, etc.

Q: Which you call in?

MISS ANNAN: We do not. We insist that those wishing such services make their own financial arrangements with these trained and expert professionals. It is apt to be expensive. We can give the names and addresses of such people to those outside of New York wishing to have such work done. The National Library of Medicine, I believe, has a similar listing.

Group 2: INFORMATION CENTER FUNCTION

Louise Darling

MISS DARLING: First let me say, I am certainly very pleased to have the opportunity to meet with you and second, that my assignment is so large that it seems to me ten hours would be insufficient; I'm afraid that this will take up so much of your time that there will be little left for discussion. In any case, if I dwell on things you already know, just stop me. Mr. Oppenheimer gave me the impression that he would like me to talk in concrete details about information center functions, with examples, rather than to talk about generalities and ideal situations, so this is what I am planning to do.

Everyone seems to collect computer jokes these days, so you may have heard this one, but because it is one of my favorites, I am going to repeat it anyway, especially since our staff has found considerable comfort in it.

A doctor, an engineer, and a computer programmer were discussing whose was the oldest profession. The doctor said that since God created Eve out of Adam's rib, and that this was a feat of surgery, medicine must be the oldest profession. The engineer replied that the Bible stated that before Adam and Eve God created Heaven and Earth and all in between, and that this was a great engineering job; thus, engineering was older. The computer programmer thought a while and then replied that in a later portion of the Bible it is stated that prior to creating Heaven and Earth and all in between there was chaos, and this was proof that the computer programming was the oldest.

The Fact Sheet recently issued by the National Library of Medicine on the Regional Medical Library Grant Program, which is authorized as part of the Medical Library Assistance Act of 1965, recommends that institutions in a region bound together naturally by geographic, economic, and social factors should prepare for the regional program by coming together in formal fashion for discussion and planning; and that they should after that hold discussions with neighboring areas so that ultimately the nation is covered by a total national network for the medical field.

This, I believe, is the first conference to be called in answer to this recommendation, and I think it could be held in no more suitable part of the country, for the libraries of this area have long been associated on a cooperative basis through your strong regional library association, the Pacific Northwest Library Association, and through the Association's Pacific Northwest Bibliographic Center; and then in the field of this group's special interest, through the Pacific Northwest Regional Group of the Medical Library Association. I think all of the medical librarians here are staunch supporters of that group. There is also the splendid example of extension service which has been furnished for so many years through the University of Oregon Medical School Library. I am less familiar with the service in British Columbia, but I know that it has an impressive record of accomplishment--and there are probably many other examples with which I am unacquainted. The very practical need for regional cooperation in this great, beautiful, and blessedly underpopulated space is certainly very familiar to everyone here, as is also the balancing fact that the West, in general, is growing faster than the nation as a whole. It is also well known, I think, to this group that the Western States are debtor states in meeting the needs for medical education and we should therefore expect or at least hope for greater acceleration of facilities in this field at a more rapid rate than elsewhere. We in California tend to assume that people will want to continue coming forever, but I think we will reach a point where it's no more desirable for physicians to leave other states and come west than to stay where they are--especially if the smog becomes much worse!

It seems unnecessary to say more about the general background against which our discussion takes place except to remind ourselves that the Heart Disease, Cancer and Stroke Program will greatly increase the need for information service, as will the recommendations of the Joint Study Committee in Continuing Medical Education (i.e., the Dryer Report)[1] when and if they are fully implemented and the "University without Walls" becomes a reality. My understanding is that work is progressing well on this score and that pilot programs will be tested soon.

In considering the information center function, we should bear in mind, first, that initially the appropriation for development of regional medical libraries is limited to $2,500,000 annually and, secondly, that the needs of the practitioner and, where appropriate, the layman as well as the investigator, must be met, though in the short amount of time available we shall have to talk of users in fairly general terms. I'm afraid my own orientation is toward the investigator because I come from a medical research center, but I think it's very important to remember that we have three needs to meet in any kind of information center that's developed for medicine.

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[1] Joint Study Committee in Continuing Medical Education. Lifetime learning for physicians: principles, practices, proposals. Cleveland, 1962.

"Information center" has become an ambiguous and inexact term these days unless it is qualified by some term, such as "analysis" or "evaluation," and unless it is designated as concerned with documents and/or with information, i.e., facts. Over 400 specialized science information services are identified in the National Science Foundation sponsored directory of 1961, and in the National Referral Center's less selective 1965 Directory of Information Resources in the United States well over a thousand services are included ranging from small office collections to real science information evaluation services.

I propose to talk about bibliographic search centers as exemplified in the UCLA MEDLARS Station, second about science information centers and science information analysis centers as exemplified in the Brain Information Service, third about training needs and finally to touch on translation requirements in information work and on electronic transmission from one unit to another within a regional network. I am in no sense an expert on these matters and what experience I have had is from the administrative side, but hopefully our experiences at UCLA will at least furnish a springboard for consideration of the kind of regional information service required in the Pacific Northwest.

1. Bibliographic Search Centers

A center of this kind would seem to be a *sine qua non* for regional medical library service, and the basic search service would obviously be MEDLARS. However, the availability on subscription from the Chemical Abstracts Service of *Chemical Titles* and of *Chemical and Biological Activities* data tapes and programs should be kept in mind and the fact that additional similar services will undoubtedly be developing right along.

A study should first be made, of course, of exactly how far the CAS supplements and how far it duplicates what is in MEDLARS. If available, data tapes for the complete catalog product of NLM and perhaps the National Agricultural Library should also be considered.

The operation of the UCLA MEDLARS Station and its relation to NLM is best explained by the set of slides which will be shown in a few moments. The UCLA Health Sciences Computing Facility is a partner in the project and carries responsibility for all programming aspects of the station's work. The Facility is operated on a grant from the National Institutes of Health for computer applications in biomedical research.

The two chief problems for searching on equipment not compatible with NLM's Honeywell 800 were conversion of data from 3/4 inch tape used by NLM's Honeywell to the 1/2 inch tape used on most equipment and rewriting MEDLARS programs from machine language to higher programming language compatible with a variety of computers of similar capacity. The language selected by NLM was COBOL, so this is the language of the UCLA programs. The tape conversion is handled in two steps: NLM converts to 1/2 inch tape, which is sent to UCLA, which then transfers the data bits from multiples of 8 to multiples of 6 for reading on its IBM 7040-7094 direct couple system. (Ours is very similar to the University of Washington's computer configuration.)

We have completed the rewriting of the programs and in a carry-on contract we have added subheadings, which were not part of the MEDLARS system at the time the contract was signed, and a provision for including monographs when MEDLARS begins to cover monographs in Index Medicus. We have also added an indication of whether or not the Biomedical Library at UCLA receives the serials currently which are indexed in MEDLARS.

I should say at the outset that the direct couple system is probably not ideal equipment for MEDLARS because it is very sophisticated in configuration, adapted primarily, in our center and I presume here, to short jobs dealing with scientific computations. MEDLARS on the other hand is a completely different kind of project with a very long file. In the UCLA facility right now all jobs which are run in the daytime are eight minutes long with an occasional fifteen minute or half hour job of high priority. The facility is open 24 hours a day, seven days a week. The long jobs are done at night or on the weekends. When you compare our COBOL programs which at the present are taking about five hours with these daytime jobs you can appreciate the kind of problems that are created. Everyone who contemplates establishing a MEDLARS search station should bear in mind that the library will be only one of many users in any academic computing facility.

Before taking up the operational pattern in the UCLA MEDLARS Station, mention should be made of the very important training program given at NLM for MEDLARS Stations search specialists and the advisability of having these people train reference staff of the library sponsoring the station as back-up for the regular search staff. Coordination of search service and reference service is another matter of critical importance. The search staff must also be prepared to hold workshops for librarians and other users in the area so that optimum use is made of the search service through an understanding of how the system works.

The library is responsible for formulating the searches, getting them to the computer, getting them back, and getting an evaluation from the requestor. In selecting our searchers I felt that we had to limit ourselves to people with science backgrounds, at least at the B.A. level. I was lucky enough to find three people, two with bachelors degrees in the biological sciences and one with a masters degree in physiological psychology. One member of our line staff, the Assistant Biomedical Librarian, who has a background in chemistry and physics, also went to NLM for search training. These four were there for periods varying from three to five months. They spent half or more of their time in the Index Section because it is extremely important to understand exactly how indexing is done there and how subject headings are interpreted. Let me give you an example of the kind of misinterpretation which may occur. You will find the word "ventilation" in Medical Subject Headings. We recently received a request from an investigator in cardiovascular diseases who included "ventilation" as one of the terms he thought should be used for his search because he was interested in respiratory physiology. However, in NLM indexing this term applies to the public health field and is used for articles dealing with the ventilation of buildings. Most of the indexing difficulties are not so obvious, and it really does require intensive training to understand MEDLARS input thoroughly.

The training program also provides for a week in the Medical Subject Heading Section and about the same amount of time in the Information Systems Division. The remaining one to two months is devoted to acquiring practical experience in formulating searches. The greater emphasis on indexing proved a good policy, especially in the case of the UCLA people who had all had prior experience in manual literature searching but none in indexing.

Having acquired the search staff, one must remember that the searchers are entitled to vacations, that they are subject to illness and accidents like everybody else, and that someday while the requests are pouring in there may be no searchers on hand to process them. Thus it is very important to be sure that there is some back-up for the service. At UCLA this insurance is provided by our reference staff who are one by one being trained in the Search Section. Following the training period, the reference librarian increases his proficiency by using both manual and MEDLARS techniques for bibliographical searches involving the literature both prior and subsequent to January 1964, the date with which the MEDLARS files begins. The Search Section then reviews the MEDLARS portion of the search before it is run on the computer. The Reference staff works primarily, as would be expected, on UCLA requests.

The operation of a search center is not something to be undertaken lightly. You have to remember that once you begin serving people outside your own institution, it's not possible to explain to them the little everyday emergencies that arise. You must come through with the service one way or another. Moreover, a center is highly dependent on the computer facilities it uses and on its ability to obtain skilled programming assistance. The computer is certain to be one shared with many other users all seeking priority on the machine. In our own case, we have found that size and number of problems in program testing and conversion have been at least twice what was originally anticipated. We expected to begin operations in January. Instead we began volume testing then and are only now at the point where we can invite you to use the station. We do that with some trepidation and a warning that because of unexpected machine and/or program problems processing a search is likely for the present to take six weeks--or even longer if the new programs for subheadings have many bugs in them. They should be ready by the first of June.

Now let us turn to the slides which will illustrate in some detail typical procedures carried out in a MEDLARS search center.

Figure 1 is from an article by Karel, Austin, and Cummings in the May 7, 1965, issue of Science.[2] I'm showing it to give you a general idea of the NLM system, with its input, publication, and retrieval subsystems.

The search stations are, of course, only concerned with the retrieval subsystem. NLM's input comes to us on data tapes which are sent monthly and then updated once a year. The maintenance is done at NLM. MEDLARS is not a static system; improvements and changes are made right along at NLM, so you can see that the need for communication between parent organization and satellite station is extremely important.

At NLM the publications subsystem is of great importance, of course, because it is through this that Index Medicus and the current bibliographies are produced. The printing is done through GRACE (Graphic Arts Composing Equipment) which produces the photosensitive tape which is then sent out for processing and distribution.

Figure 2 shows the general relation of the search stations to NLM. These are the stations which are now authorized: the UCLA station, serving the Pacific time zone, Alaska and Hawaii: the University of Colorado station, which has been operating longer than any of the others and serves the Mountain time zone; then Harvard, University of Michigan and University of Alabama which are just beginning. They will use various modifications of the UCLA COBOL programs because their computer centers are equipped with IBM machines. Modifications are required in every case because none have configurations identical with one another nor with the direct couple system at UCLA.

In our own set-up, the Biomedical Library and the Health Sciences Computing Facility are partners in the station. The Library's Public Services Division, as I said before, furnishes backup for searching. It also fills requests for xerox copies of articles cited in the search bibliographies.

The UCLA Biomedical Library has about 80 per cent of what is indexed in Index Medicus and, we believe, the 80 per cent that is used most. Thus in the great majority of cases we can support bibliographical searching with hard copy--providing, of course, the volume is not in circulation or at the bindery!

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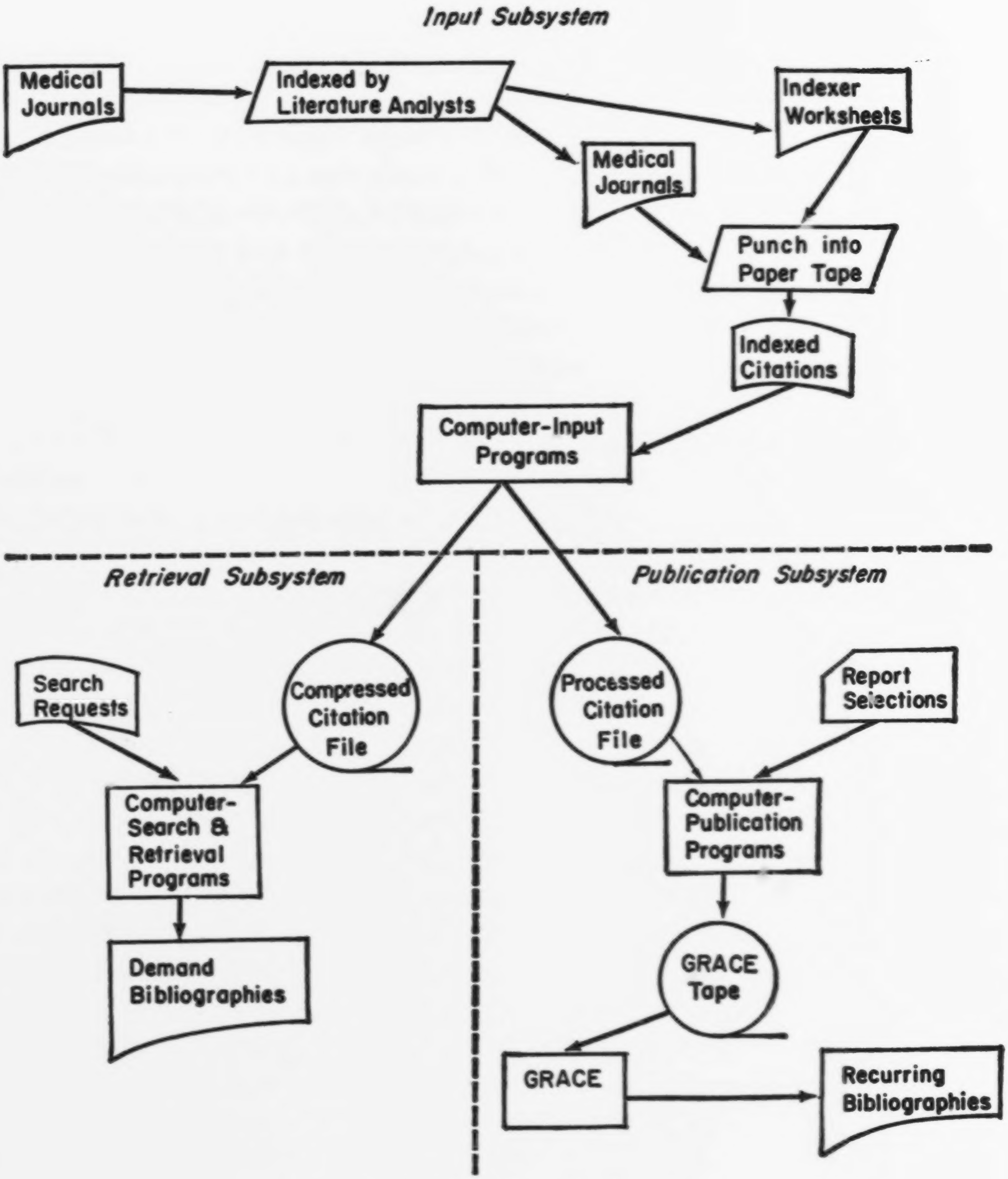
[2] Karel, L., Austin, C. J. and Cummings, M. M. Computerized bibliographic services for biomedicine. Science, 148:766-772, May 7, 1965. Copyright 1965 by the American Association for the Advancement of Science.


Input Subsystem
Medical Journals
Indexed by Literature Analysts
Indexer Worksheets
Medical Journals
Punch into Paper Tape
Indexed Citations
Computer-Input Programs
Retrieval Subsystem
Publication Subsystem
Search Requests
Compressed Citation File
Processed Citation File
Report Selections
Computer-Search & Retrieval Programs
Computer-Publication Programs
Demand Bibliographies
GRACE Tape
GRACE
Recurring Bibliographies

768 **MEDLARS flow chart**

Fig. 1 Reprinted from Science, 148:768, May 7, 1965.

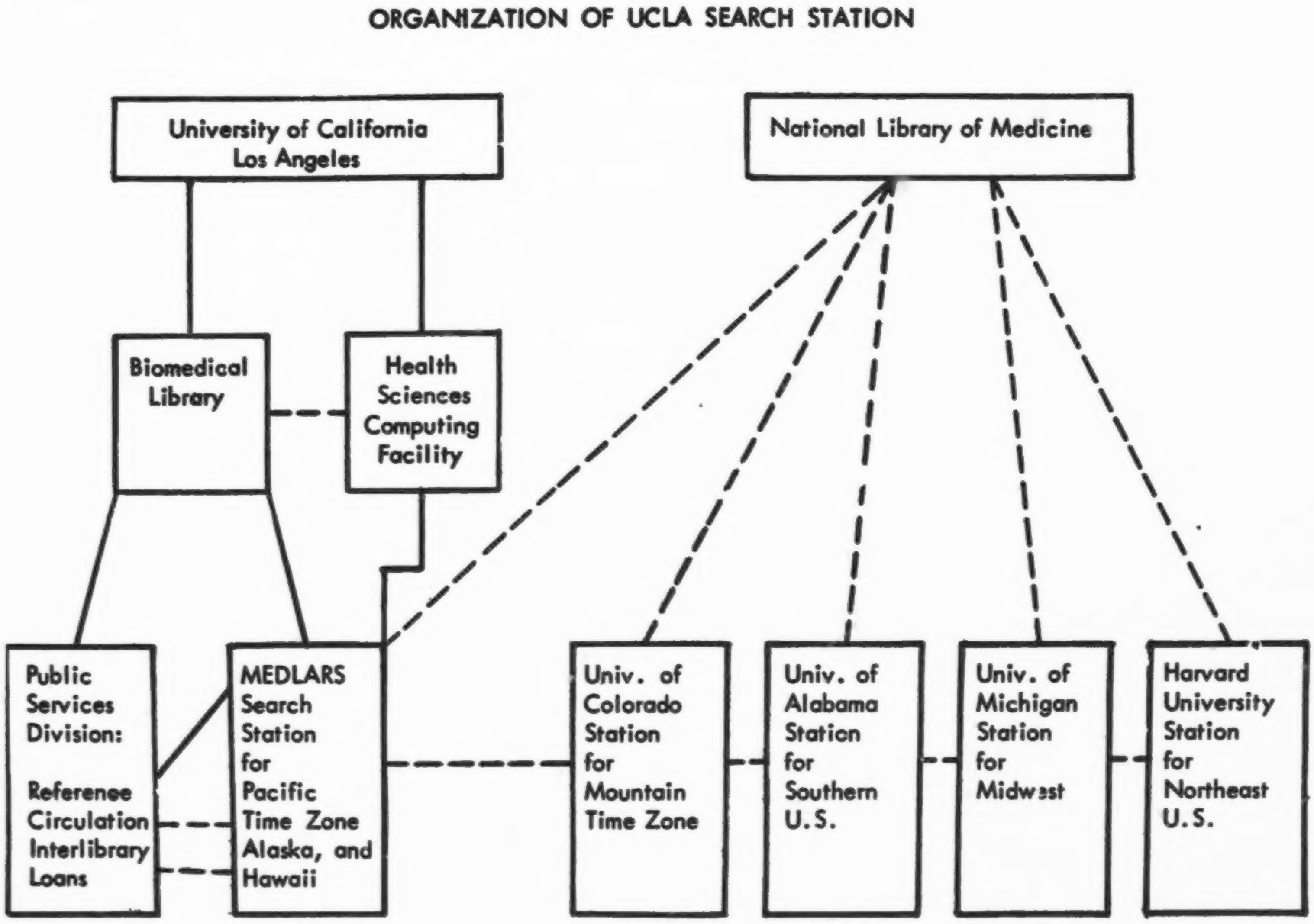

ORGANIZATION OF UCLA SEARCH STATION
University of California Los Angeles
National Library of Medicine
Biomedical Library
Health Sciences Computing Facility
Public Services Division: Reference Circulation Interlibrary Loans
MEDLARS Search Station for Pacific Time Zone Alaska, and Hawaii
Univ. of Colorado Station for Mountain Time Zone
Univ. of Alabama Station for Southern U.S.
Univ. of Michigan Station for Midwest
Harvard University Station for Northeast U.S.

Fig. 2 Organization of UCLA Search Station and Its Relation to other Stations and the National Library of Medicine.

The latter is not the problem it used to be because shipments are now returned every two weeks, thanks to mechanization of operations in the Los Angeles branch of the University of California Press Bindery. Also, beginning with the fall 1966 quarter, journals published from 1960 to date will no longer circulate. It is of obvious importance in planning a bibliographical search center to make sure that a significant segment of the literature cited on the data tapes is in the center's collection and immediately available.

Whenever possible search requests are treated as interlibrary loans, that is, we prefer that requests come from individuals through libraries, though requests will also be accepted from individuals. We have conducted one-day workshops in Los Angeles and in San Francisco to give the local medical librarians information on the system so that they can advise users, if requests are not suitable or assist them in being more specific in the formulation of requests.

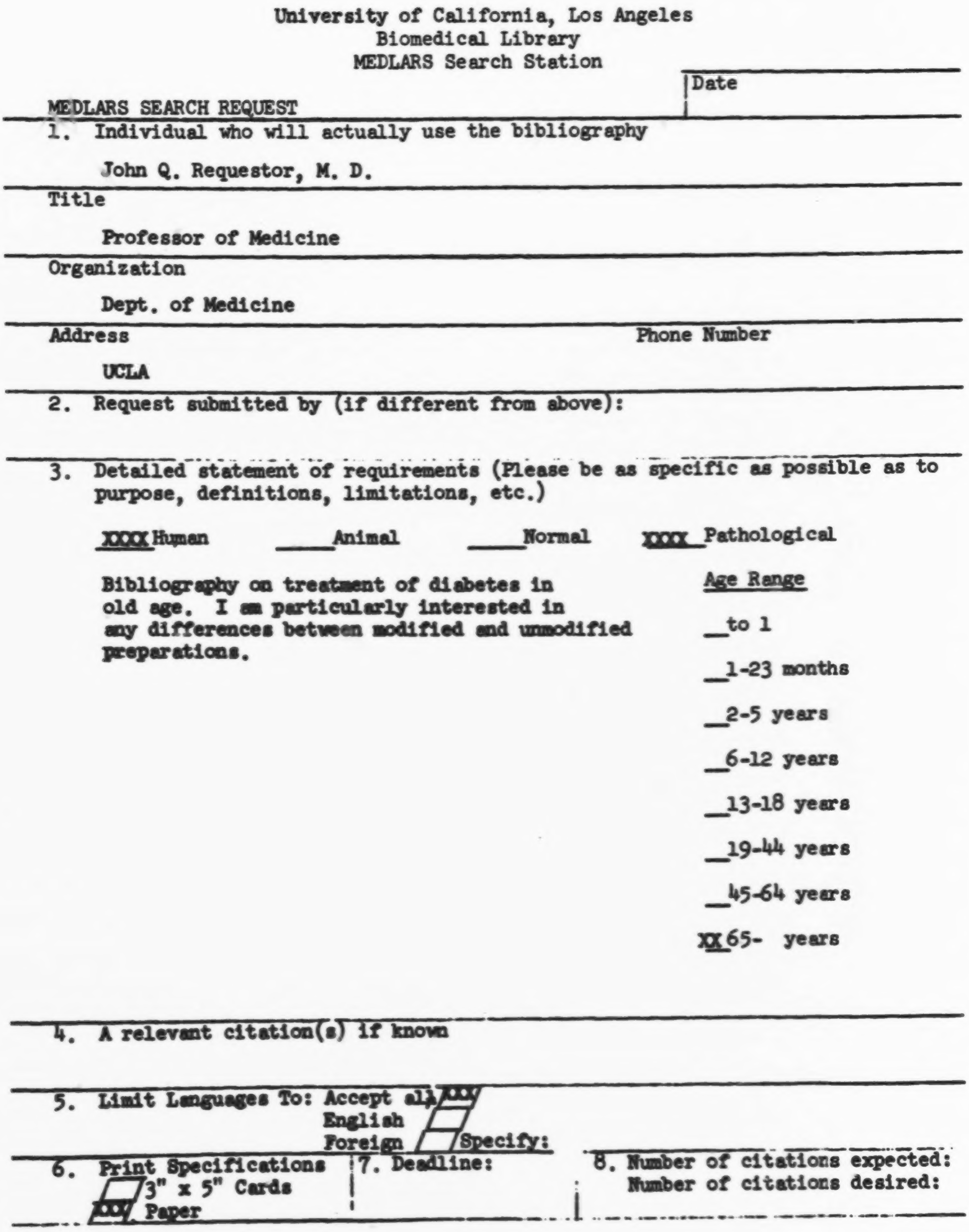
Let us now take up a request form (Fig. 3). First, we require information about the requester. Next we ask for a detailed statement of his requirements. We don't specifically ask him to list MeSH headings; we find that since the requester is usually not familiar with Index Medicus in detail or with its subject headings, it is better for him to tell us, in language natural to him, what he wants.

Then there are four parameters we always want to know: is the requester interested in work with humans? With animals? With both? Is he interested in work carried on with normal subjects? With pathological subjects? With both? Correct information on these points makes a large difference in whether the request satisfies the individual or not.

Another very important item to be indicated if possible is a known relevant citation. If the requester can name one paper that really met his needs, the searcher can obtain a very good idea of what is really wanted and can then look for other articles with similar concepts. Of course, often the existence of a relevant paper is not known. Then we want to know what languages are appropriate for the requester, and whether he would like his request printed out on paper or whether he would prefer 3" x 5" cards. Next we ask for a deadline. If the search bibliography is not going to be of any value to the requester after a certain date and we know we can't meet the date, we notify him of this by letter or telephone. We also like to know the number of citations expected and the number desired. If the requester has some idea of how much literature there is on the subject, that is of great help to us. But he may not want everything, and that is the purpose of this line "number of citations desired."

Figure 4 merely reproduces a small section of the categorical arrangement of terms in MeSH.

Figure 5 takes us into the MeSH categorical table showing its breakdown into a tree structure so that a search on exploded terms can be conducted. A category may be entered at four levels; everything below the level at which you enter can be obtained. You might be interested to know that there is a capacity for 127 of these tree structures in MEDLARS.



University of California, Los Angeles
Biomedical Library
MEDLARS Search Station

Date

MEDLARS SEARCH REQUEST

1. Individual who will actually use the bibliography

John Q. Requestor, M. D.

Title

Professor of Medicine

Organization

Dept. of Medicine

Address

UCLA

Phone Number

2. Request submitted by (if different from above):

3. Detailed statement of requirements (Please be as specific as possible as to purpose, definitions, limitations, etc.)

XXXX Human ____ Animal ____ Normal XXXX Pathological

Bibliography on treatment of diabetes in old age. I am particularly interested in any differences between modified and unmodified preparations.

Age Range

__ to 1
__ 1-23 months
__ 2-5 years
__ 6-12 years
__ 13-18 years
__ 19-44 years
__ 45-64 years
XX 65- years

4. A relevant citation(s) if known

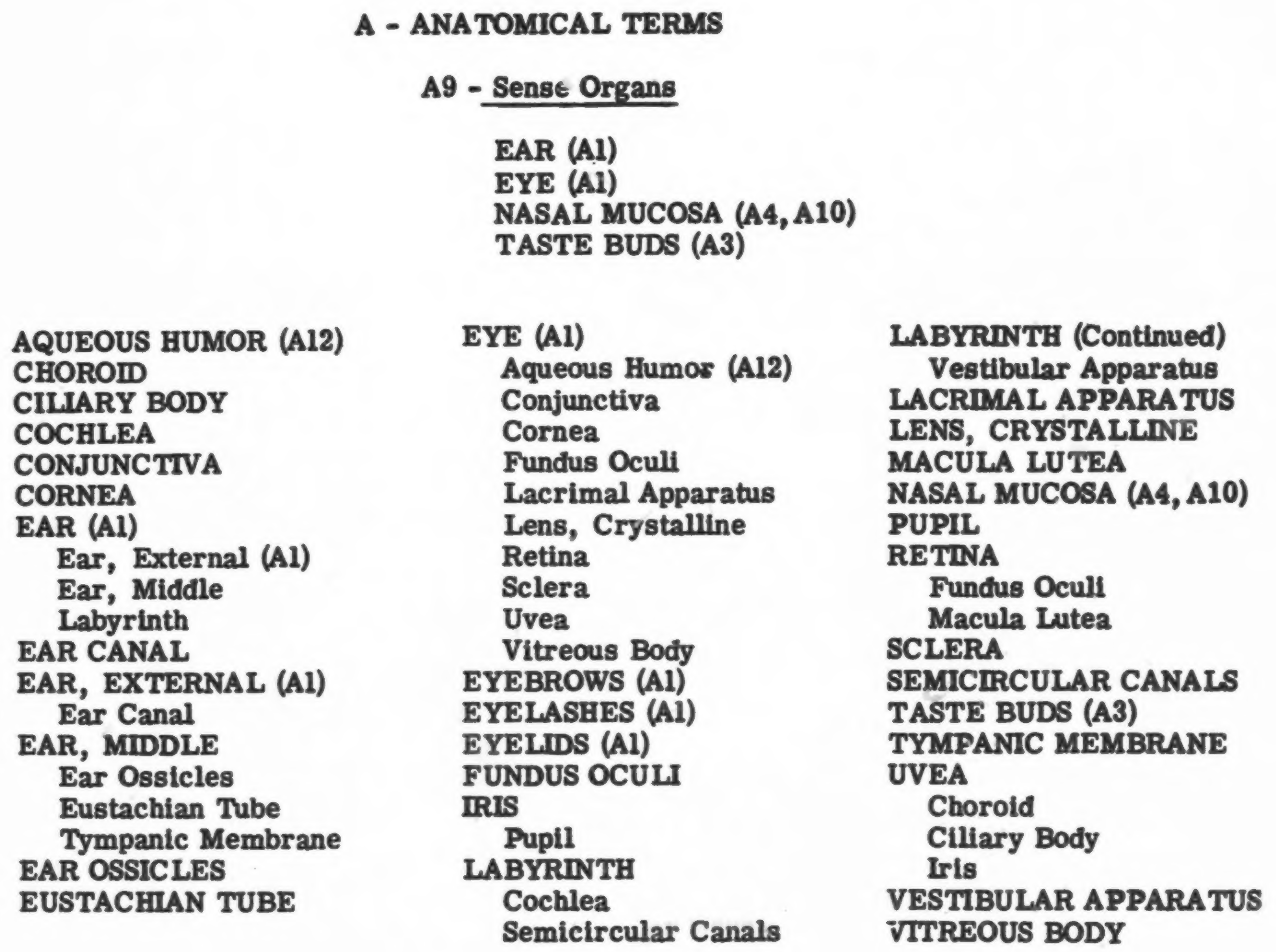
5. Limit Languages To: Accept all ☒
English ☐
Foreign ☐ Specify:

6. Print Specifications
☐ 3" x 5" Cards
☒ Paper

7. Deadline:

8. Number of citations expected:
Number of citations desired:

Fig. 3 Search Request Form, UCLA MEDLARS Station.



A - ANATOMICAL TERMS

A9 - Sense Organs

- EAR (A1)
- EYE (A1)
- NASAL MUCOSA (A4, A10)
- TASTE BUDS (A3)

- AQUEOUS HUMOR (A12)
- CHOROID
- CILIARY BODY
- COCHLEA
- CONJUNCTIVA
- CORNEA
- EAR (A1)
  - Ear, External (A1)
  - Ear, Middle
  - Labyrinth
- EAR CANAL
- EAR, EXTERNAL (A1)
  - Ear Canal
- EAR, MIDDLE
  - Ear Ossicles
  - Eustachian Tube
  - Tympanic Membrane
- EAR OSSICLES
- EUSTACHIAN TUBE
- EYE (A1)
  - Aqueous Humor (A12)
  - Conjunctiva
  - Cornea
  - Fundus Oculi
  - Lacrimal Apparatus
  - Lens, Crystalline
  - Retina
  - Sclera
  - Uvea
  - Vitreous Body
- EYEBROWS (A1)
- EYELASHES (A1)
- EYELIDS (A1)
- FUNDUS OCULI
- IRIS
  - Pupil
- LABYRINTH
  - Cochlea
  - Semicircular Canals
- LABYRINTH (Continued)
  - Vestibular Apparatus
- LACRIMAL APPARATUS
- LENS, CRYSTALLINE
- MACULA LUTEA
- NASAL MUCOSA (A4, A10)
- PUPIL
- RETINA
  - Fundus Oculi
  - Macula Lutea
- SCLERA
- SEMICIRCULAR CANALS
- TASTE BUDS (A3)
- TYMPANIC MEMBRANE
- UVEA
  - Choroid
  - Ciliary Body
  - Iris
- VESTIBULAR APPARATUS
- VITREOUS BODY

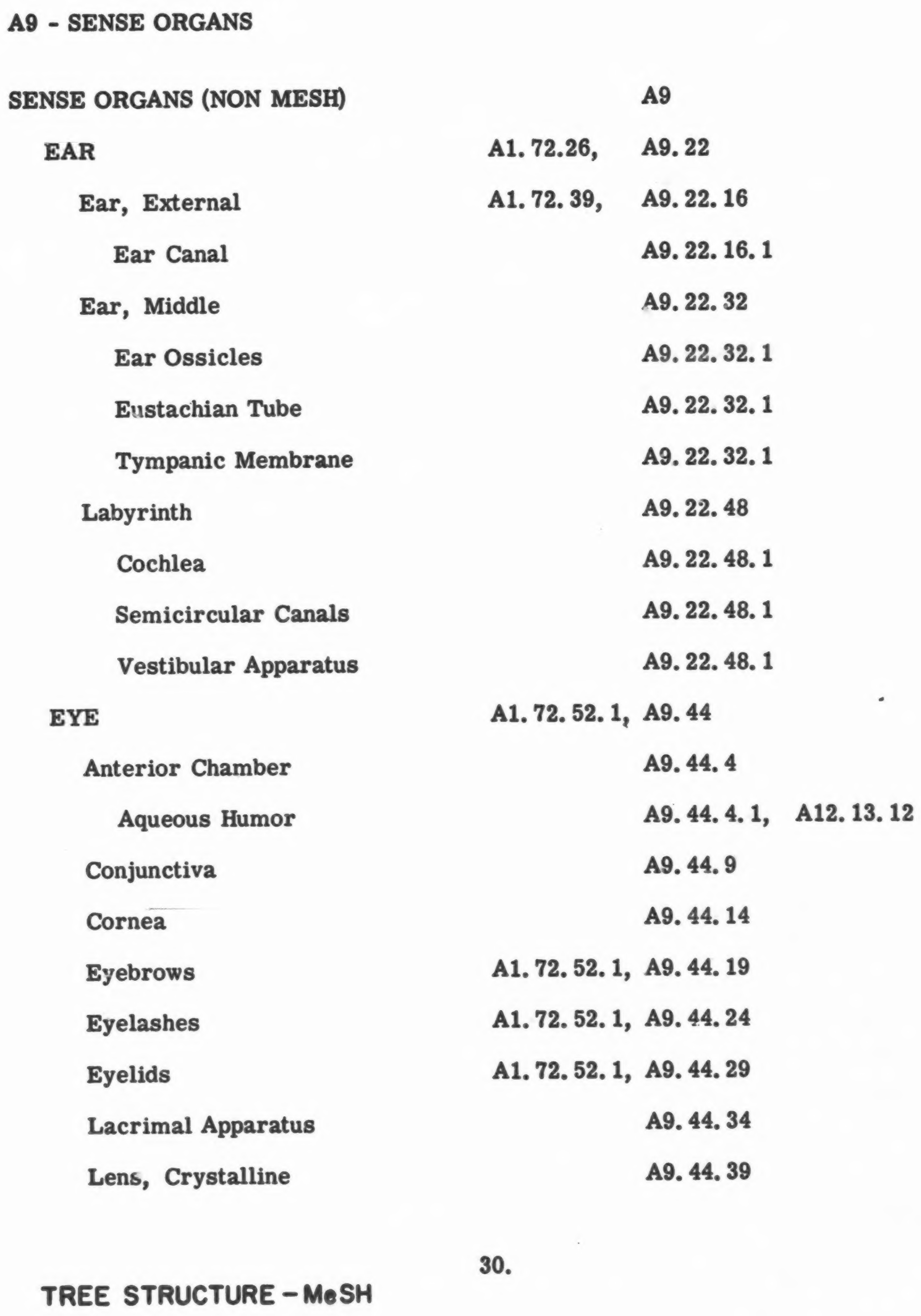
Fig. 4 Categorical Table, from National Library of Medicine's Medical Subject Headings, 1966, p. 184.

Figure 6 shows the formulation sheet which our searchers use. This particular one is for a search on the effect of hallucinogens on perception, with special reference to LSD. The general information is given at the top above the search formulation.

Figure 7 lists all of the elements or terms that will have to be used for the computer search.

Figure 8 illustrates the preliminary edit routine. The decklet of punched cards for the search is run against the MEDLARS dictionary tape (the MeSH subject heading tape with some other information added) to tell us if any errors were made in the keypunching and to give us a tally of the number of citations we can expect to retrieve from our formulation.

It is extremely important to be sure that the keypunching is correct, for if it is not, the computer in our facility will reject the batch of searches when it comes to the error and the time alloted us will in consequence be lost.



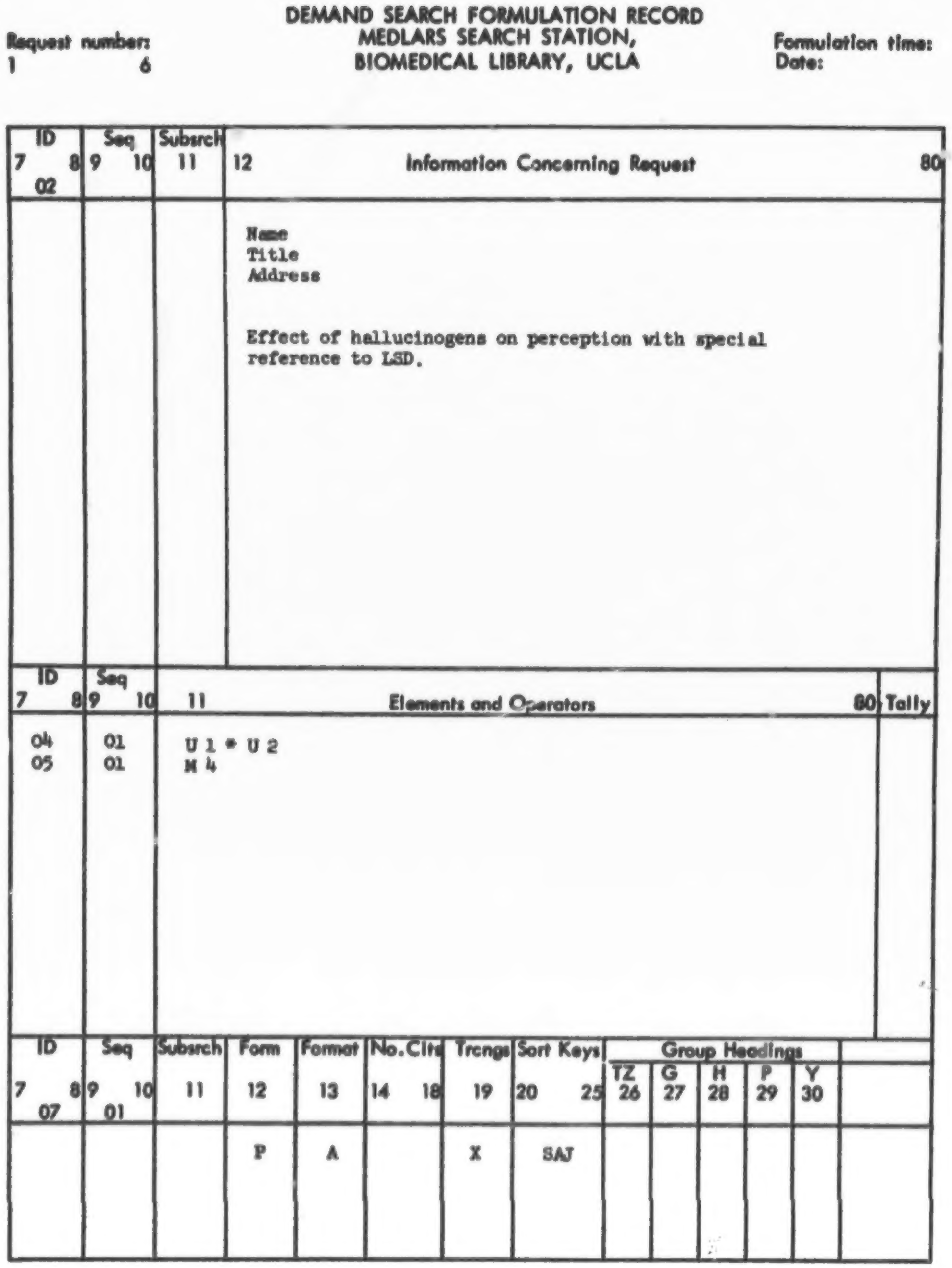
A9 - SENSE ORGANS

SENSE ORGANS (NON MESH)		A9	
EAR	A1.72.26,	A9.22	
Ear, External	A1.72.39,	A9.22.16	
Ear Canal		A9.22.16.1	
Ear, Middle		A9.22.32	
Ear Ossicles		A9.22.32.1	
Eustachian Tube		A9.22.32.1	
Tympanic Membrane		A9.22.32.1	
Labyrinth		A9.22.48	
Cochlea		A9.22.48.1	
Semicircular Canals		A9.22.48.1	
Vestibular Apparatus		A9.22.48.1	
EYE	A1.72.52.1,	A9.44	
Anterior Chamber		A9.44.4	
Aqueous Humor		A9.44.4.1,	A12.13.12
Conjunctiva		A9.44.9	
Cornea		A9.44.14	
Eyebrows	A1.72.52.1,	A9.44.19	
Eyelashes	A1.72.52.1,	A9.44.24	
Eyelids	A1.72.52.1,	A9.44.29	
Lacrimal Apparatus		A9.44.34	
Lens, Crystalline		A9.44.39	

30.

TREE STRUCTURE - MeSH

Fig. 5 Tree Structure from the 1965 Medical Dictionary Tape.



DEMAND SEARCH FORMULATION RECORD
MEDLARS SEARCH STATION,
BIOMEDICAL LIBRARY, UCLA

Request number:
1 6

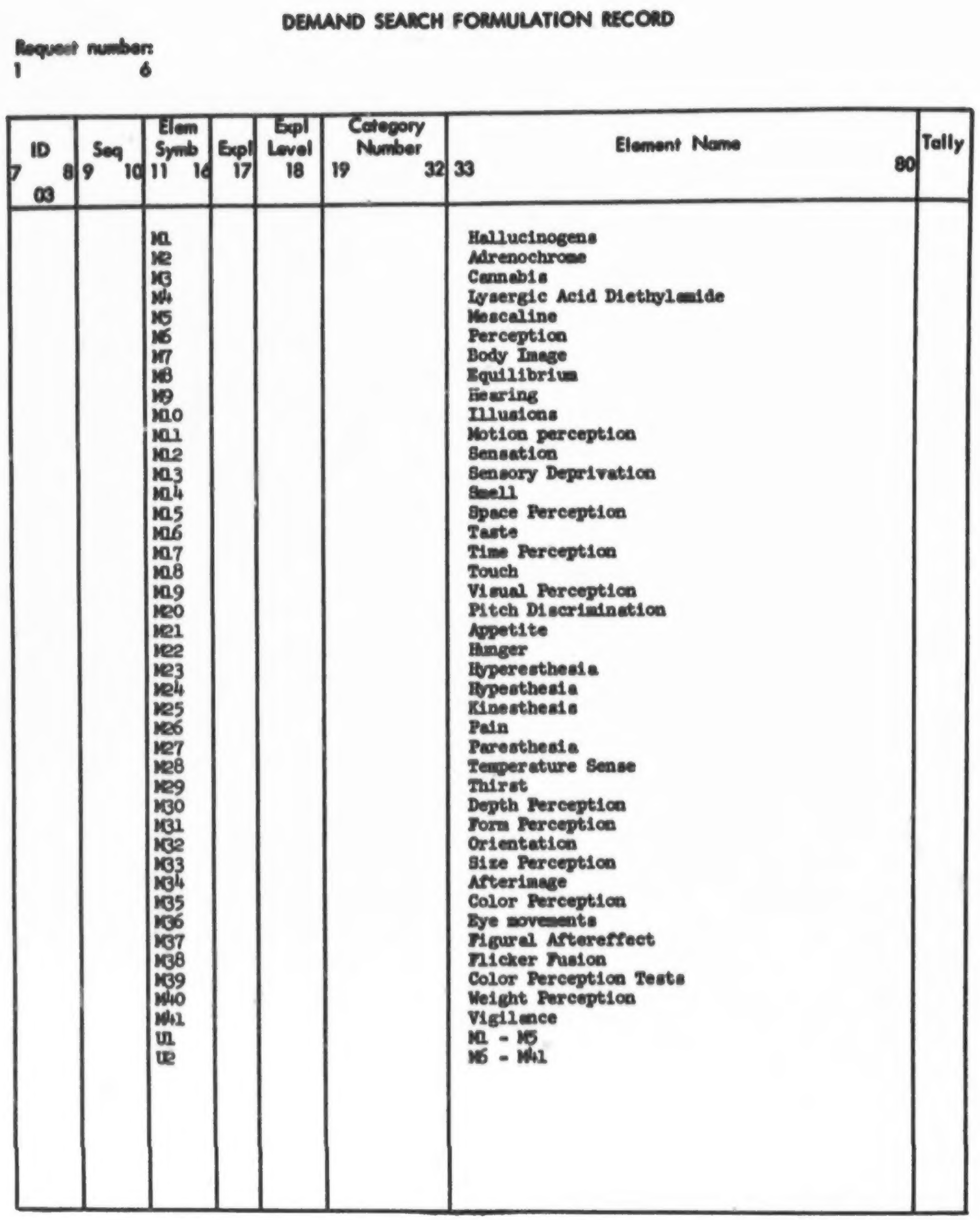
Formulation time:
Date:

ID 7 8 02	Seq 9 10	Subsrch 11	12 Information Concerning Request 80
			Name Title Address Effect of hallucinogens on perception with special reference to LSD.

ID 7 8	Seq 9 10	11 Elements and Operators 80	Tally
04	01	U 1 * U 2	
05	01	M 4	

ID 7 8 07	Seq 9 10 01	Subsrch 11	Form 12	Format 13	No. Cits 14 18	Trcngs 19	Sort Keys 20 25	Group Headings TZ 26	G 27	H 28	P 29	Y 30	
			P	A		X	SAJ						

Fig. 6 Demand Search Formulation Record.



DEMAND SEARCH FORMULATION RECORD

Request number:
1 6

ID 7 8 03	Seq 9 10	Elem Symb 11 16	Expl 17	Expl Level 18	Category Number 19 32	Element Name 33 80	Tally
		M1				Hallucinogens	
		M2				Adrenochrome	
		M3				Cannabis	
		M4				Lysergic Acid Diethylamide	
		M5				Mescaline	
		M6				Perception	
		M7				Body Image	
		M8				Equilibrium	
		M9				Hearing	
		M10				Illusions	
		M11				Motion perception	
		M12				Sensation	
		M13				Sensory Deprivation	
		M14				Smell	
		M15				Space Perception	
		M16				Taste	
		M17				Time Perception	
		M18				Touch	
		M19				Visual Perception	
		M20				Pitch Discrimination	
		M21				Appetite	
		M22				Hunger	
		M23				Hyperesthesia	
		M24				Hypesthesia	
		M25				Kinesthesis	
		M26				Pain	
		M27				Paresthesia	
		M28				Temperature Sense	
		M29				Thirst	
		M30				Depth Perception	
		M31				Form Perception	
		M32				Orientation	
		M33				Size Perception	
		M34				Afterimage	
		M35				Color Perception	
		M36				Eye movements	
		M37				Figural Aftereffect	
		M38				Flicker Fusion	
		M39				Color Perception Tests	
		M40				Weight Perception	
		M41				Vigilance	
		U1				M1 - M5	
		U2				M6 - M41	

Fig. 7 Verso of Demand Search Formulation Record showing the Request Element Definition List.

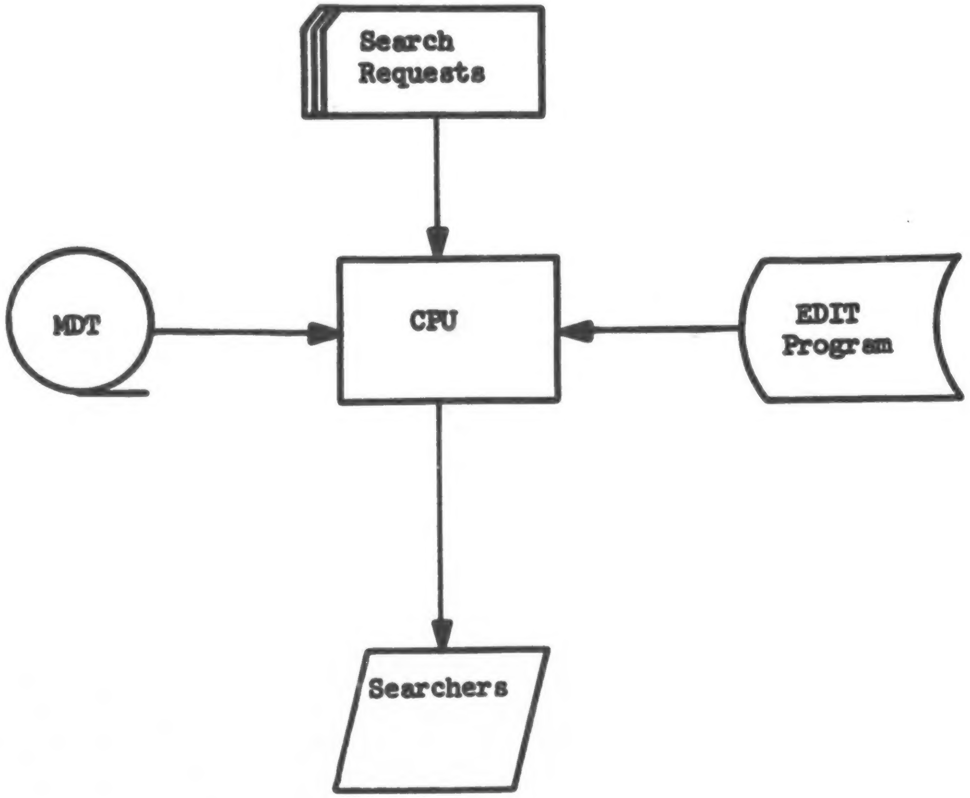

Search Requests
MDT
CPU
EDIT Program
Searchers

Fig. 8 Flow chart for Preliminary Edit Program used in UCLA MEDLARS Search Station.

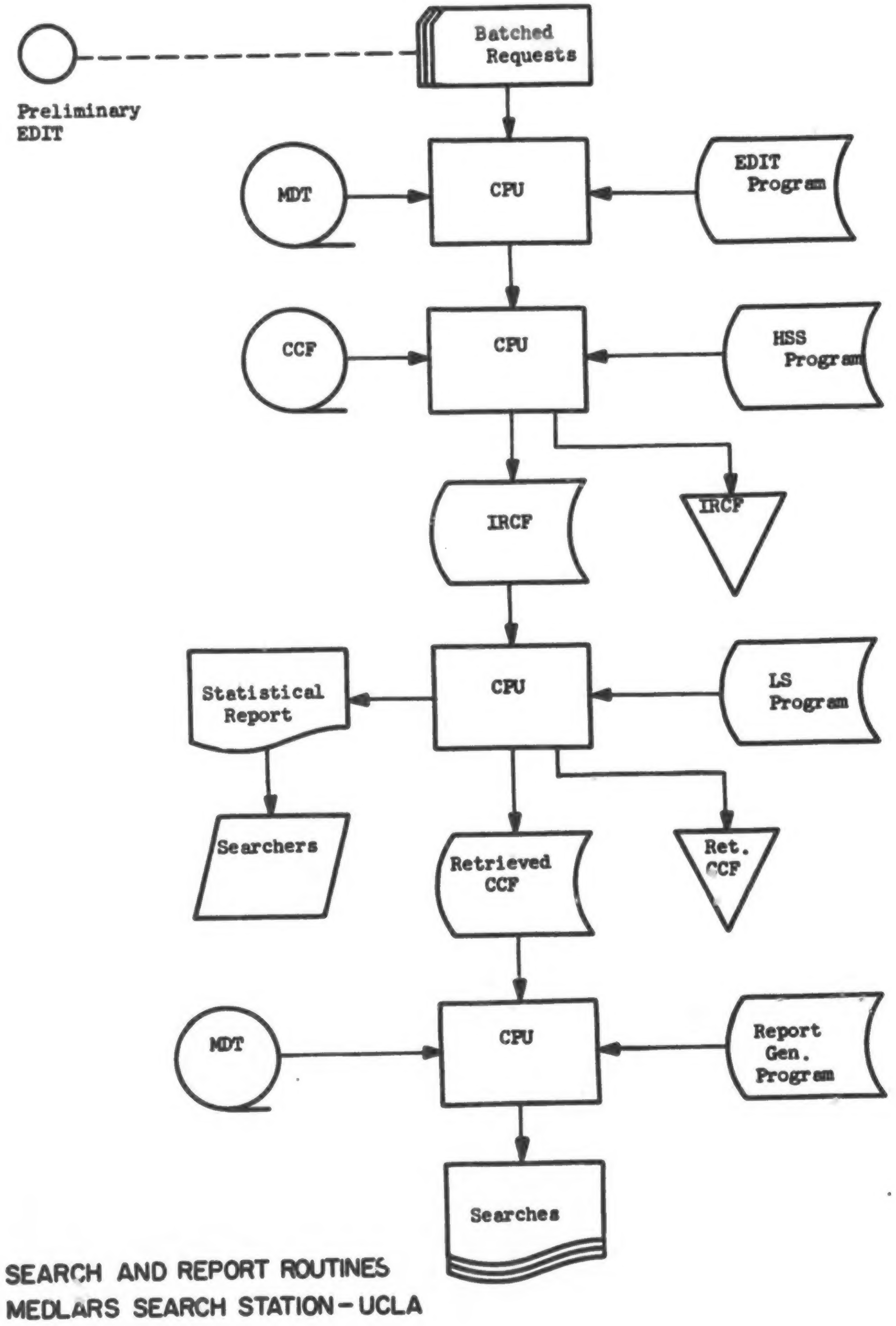

Preliminary EDIT
Batched Requests
MDT
CPU
EDIT Program
CCF
CPU
HSS Program
IRCF
IRCF
Statistical Report
CPU
LS Program
Searchers
Retrieved CCF
Ret. CCF
MDT
CPU
Report Gen. Program
Searches
SEARCH AND REPORT ROUTINES
MEDLARS SEARCH STATION-UCLA

Fig. 9 Flow chart showing Search and Report routines, UCLA MEDLARS Station.

It is important to know the number of citations to be retrieved because this indicates approximately how long it will take to run the batch of searches.

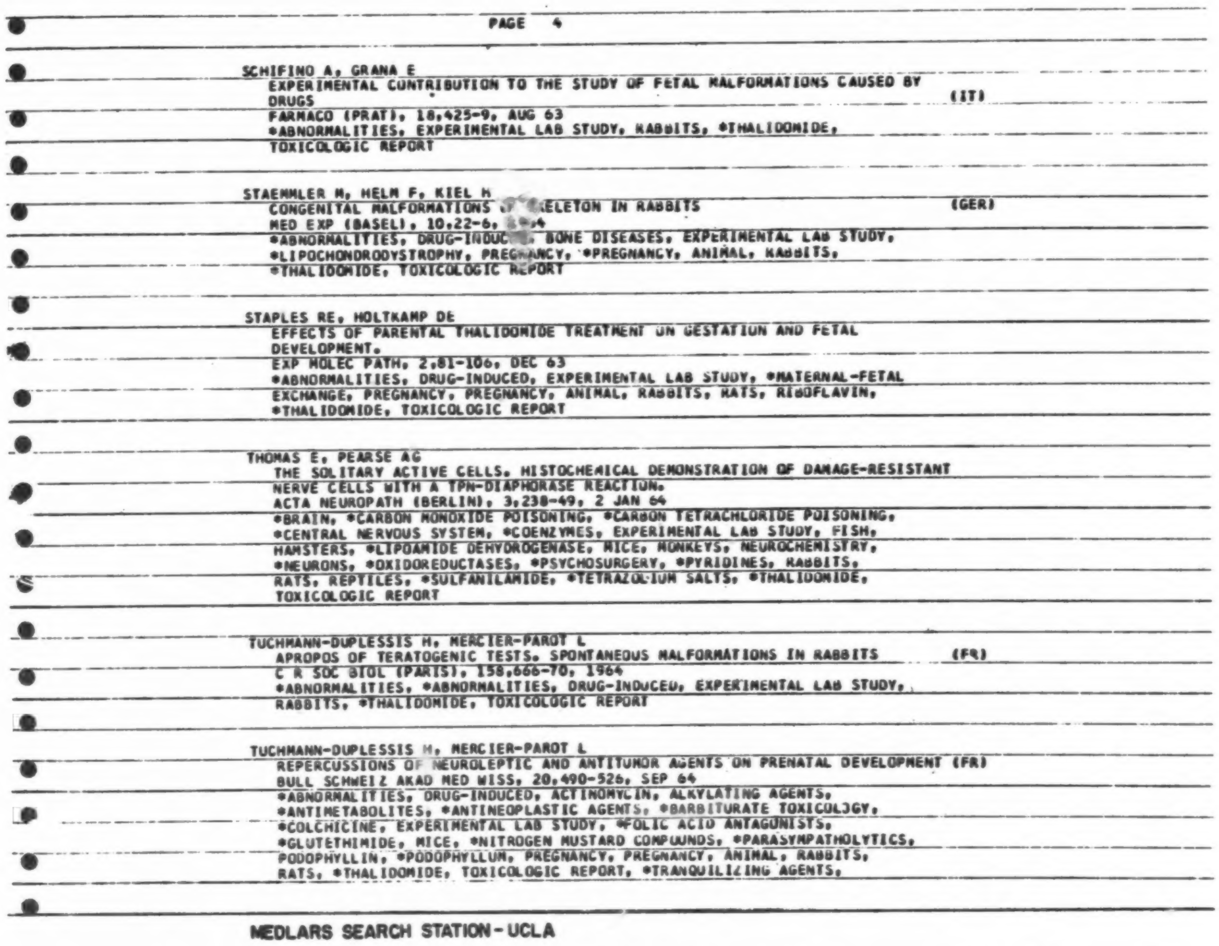
If the batch runs through preliminary edit successfully, it is resubmitted for the complete search procedure beginning with edit and going from there to high speed search during which the whole file is searched, from 1964 to date (Fig. 9). All of the citations tagged for any of the elements in the search are retrieved. The product of the gross search may be saved off line if time is nearly up, or proceed to logical search which is the next step. In logical search, the citations which satisfy the search formulation are pulled from the file of citations retrieved in high speed search.

Citations on both of these files are arranged randomly and the subject tracings which are attached to each citation are in code. Thus, even were you able to look at these on a console, it wouldn't be very helpful. But in report generator, sorting takes place and code goes into English. Therefore, at this point it would be very profitable to be able to have a look at the retrieval before it is printed out. In any case, at this point you are able to obtain a report on the number of citations retrieved for each search, not just for the batch, but for each search in the batch, if you are a bit dubious about the search--and when you are new at searching you should be dubious. However, it is possible to skip the statistical report and obtain the print-out directly.

Figure 10 represents a print-out on paper. Print-out of tracings is optional. We prefer to have them on all our searches right now because it is a way of checking our search strategy. Figure 11 represents a different format. Here the articles are in order by journal title instead of by author. This format is particularly useful if the requester plans to request hard copy for most or all of the items in the bibliography since the listing is then in order for quick paging from the shelf.

Figure 12 shows card format. Sheets of 3" x 5" cards are used and each card carries one citation.

Attached to the evaluation form is a note (Fig. 13) stating: "The bibliography which you have received is a product of MEDLARS, a computer based information storage and retrieval system. While the system is in its developmental phase, all information concerning the operation is of value to its future success. As a user of MEDLARS you are in a position to provide both



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                         PAGE   4

SCHIFINO A, GRANA E
   EXPERIMENTAL CONTRIBUTION TO THE STUDY OF FETAL MALFORMATIONS CAUSED BY
   DRUGS                                                                 (IT)
   FARMACO (PRAT), 18,425-9, AUG 63
   *ABNORMALITIES, EXPERIMENTAL LAB STUDY, RABBITS, *THALIDOMIDE,
   TOXICOLOGIC REPORT

STAEMMLER M, HELM F, KIEL H
   CONGENITAL MALFORMATIONS OF SKELETON IN RABBITS                       (GER)
   MED EXP (BASEL), 10,22-6, 1964
   *ABNORMALITIES, DRUG-INDUCED, BONE DISEASES, EXPERIMENTAL LAB STUDY,
   *LIPOCHONDRODYSTROPHY, PREGNANCY, *PREGNANCY, ANIMAL, RABBITS,
   *THALIDOMIDE, TOXICOLOGIC REPORT

STAPLES RE, HOLTKAMP DE
   EFFECTS OF PARENTAL THALIDOMIDE TREATMENT ON GESTATION AND FETAL
   DEVELOPMENT.
   EXP MOLEC PATH, 2,81-106, DEC 63
   *ABNORMALITIES, DRUG-INDUCED, EXPERIMENTAL LAB STUDY, *MATERNAL-FETAL
   EXCHANGE, PREGNANCY, PREGNANCY, ANIMAL, RABBITS, RATS, RIBOFLAVIN,
   *THALIDOMIDE, TOXICOLOGIC REPORT

THOMAS E, PEARSE AG
   THE SOLITARY ACTIVE CELLS. HISTOCHEMICAL DEMONSTRATION OF DAMAGE-RESISTANT
   NERVE CELLS WITH A TPN-DIAPHORASE REACTION.
   ACTA NEUROPATH (BERLIN), 3,238-49, 2 JAN 64
   *BRAIN, *CARBON MONOXIDE POISONING, *CARBON TETRACHLORIDE POISONING,
   *CENTRAL NERVOUS SYSTEM, *COENZYMES, EXPERIMENTAL LAB STUDY, FISH,
   HAMSTERS, *LIPOAMIDE DEHYDROGENASE, MICE, MONKEYS, NEUROCHEMISTRY,
   *NEURONS, *OXIDOREDUCTASES, *PSYCHOSURGERY, *PYRIDINES, RABBITS,
   RATS, REPTILES, *SULFANILAMIDE, *TETRAZOLIUM SALTS, *THALIDOMIDE,
   TOXICOLOGIC REPORT

TUCHMANN-DUPLESSIS H, MERCIER-PAROT L
   APROPOS OF TERATOGENIC TESTS. SPONTANEOUS MALFORMATIONS IN RABBITS     (FR)
   C R SOC BIOL (PARIS), 158,666-70, 1964
   *ABNORMALITIES, *ABNORMALITIES, DRUG-INDUCED, EXPERIMENTAL LAB STUDY,
   RABBITS, *THALIDOMIDE, TOXICOLOGIC REPORT

TUCHMANN-DUPLESSIS H, MERCIER-PAROT L
   REPERCUSSIONS OF NEUROLEPTIC AND ANTITUMOR AGENTS ON PRENATAL DEVELOPMENT (FR)
   BULL SCHWEIZ AKAD MED WISS, 20,490-526, SEP 64
   *ABNORMALITIES, DRUG-INDUCED, ACTINOMYCIN, ALKYLATING AGENTS,
   *ANTIMETABOLITES, *ANTINEOPLASTIC AGENTS, *BARBITURATE TOXICOLOGY,
   *COLCHICINE, EXPERIMENTAL LAB STUDY, *FOLIC ACID ANTAGONISTS,
   *GLUTETHIMIDE, MICE, *NITROGEN MUSTARD COMPOUNDS, *PARASYMPATHOLYTICS,
   PODOPHYLLIN, *PODOPHYLLUM, PREGNANCY, PREGNANCY, ANIMAL, RABBITS,
   RATS, *THALIDOMIDE, TOXICOLOGIC REPORT, *TRANQUILIZING AGENTS,

MEDLARS SEARCH STATION-UCLA
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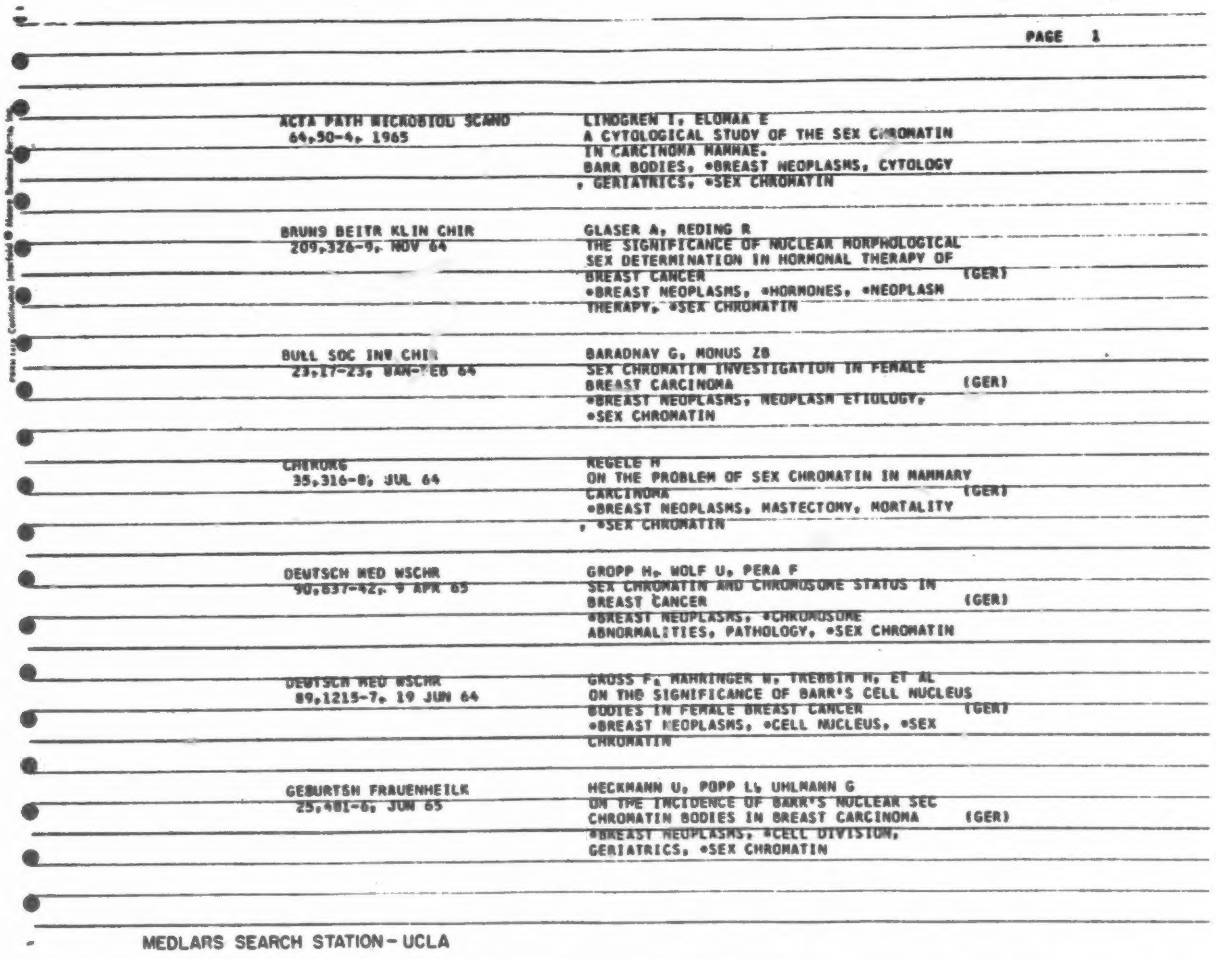
Fig. 10 Author Format, MEDLARS Demand Search Bibliography.



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                                                                  PAGE   1

ACTA PATH MICROBIOL SCAND      LINDGREN I, ELOMAA E
 64,50-4, 1965                 A CYTOLOGICAL STUDY OF THE SEX CHROMATIN
                               IN CARCINOMA MAMMAE.
                               BARR BODIES, *BREAST NEOPLASMS, CYTOLOGY
                              , GERIATRICS, *SEX CHROMATIN

BRUNS BEITR KLIN CHIR          GLASER A, REDING R
 209,326-9, NOV 64             THE SIGNIFICANCE OF NUCLEAR MORPHOLOGICAL
                               SEX DETERMINATION IN HORMONAL THERAPY OF
                               BREAST CANCER                          (GER)
                               *BREAST NEOPLASMS, *HORMONES, *NEOPLASM
                               THERAPY, *SEX CHROMATIN

BULL SOC INV CHIR              BARADNAY G, MONUS ZB
 23,17-23, JAN-FEB 64          SEX CHROMATIN INVESTIGATION IN FEMALE
                               BREAST CARCINOMA                       (GER)
                               *BREAST NEOPLASMS, NEOPLASM ETIOLOGY,
                               *SEX CHROMATIN

CHIRURG                        REGELE H
 35,316-8, JUL 64              ON THE PROBLEM OF SEX CHROMATIN IN MAMMARY
                               CARCINOMA                              (GER)
                               *BREAST NEOPLASMS, MASTECTOMY, MORTALITY
                              , *SEX CHROMATIN

DEUTSCH MED WSCHR              GROPP H, WOLF U, PERA F
 90,637-42, 9 APR 65           SEX CHROMATIN AND CHROMOSOME STATUS IN
                               BREAST CANCER                          (GER)
                               *BREAST NEOPLASMS, *CHROMOSOME
                               ABNORMALITIES, PATHOLOGY, *SEX CHROMATIN

DEUTSCH MED WSCHR              GROSS F, MAHRINGER W, TREBBIN H, ET AL
 89,1215-7, 19 JUN 64          ON THE SIGNIFICANCE OF BARR'S CELL NUCLEUS
                               BODIES IN FEMALE BREAST CANCER         (GER)
                               *BREAST NEOPLASMS, *CELL NUCLEUS, *SEX
                               CHROMATIN

GEBURTSH FRAUENHEILK           HECKMANN U, POPP L, UHLMANN G
 25,481-6, JUN 65              ON THE INCIDENCE OF BARR'S NUCLEAR SEC
                               CHROMATIN BODIES IN BREAST CARCINOMA   (GER)
                               *BREAST NEOPLASMS, *CELL DIVISION,
                               GERIATRICS, *SEX CHROMATIN

MEDLARS SEARCH STATION-UCLA
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Fig. 11. Journal Format, MEDLARS Demand Search Bibliography.

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                                       50106
ALLEGRA SR

BRAIN  SCANNING  WITH  MERCURY: THEORY,
TECHNIQUE  AND  ACCURACY  OF  THE  METHOD.

TURK J PEDIAT 7:31-43, JAN 65

*BRAIN NEOPLASMS;  *MERCURY;
*RADIOISOTOPE SCANNING
```

```
                                       50106
AVIOLI LV, CRACCO RQ, CHAMBERS R

203  MERCURY BRAIN SCANS: THE USE OF SMALL
DOSES  AS  A  SCREENING  METHOD.

J NUCL MED 6:252-64, APR 65 **

BRAIN ABSCESS;  *BRAIN DISEASES;  *BRAIN
NEOPLASMS;  CEREBRAL ANEURYSM;  *DIURETICS,
MERCURIAL;  HEMATOMA, SUBDURAL;
HYDROCEPHALUS;  NEOPLASM DIAGNOSIS;
*RADIOISOTOPE SCANNING;  STATISTICS;
SUBARACHNOID HEMORRHAGE
```

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                                       50106
BARKE R, GURSKY S

(THE  RADIOIODINE  TEST  IN  RATS)   (GER)

RADIOBIOL RADIOTHER (BERLIN) 5:511-5, 1964

*IODINE ISOTOPES, DIAGNOSTIC;
RADIOISOTOPE SCANNING;  RATS;  *THYROID
FUNCTION TESTS
```

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                                       50106
BARRY D

CLINICAL  ASPECTS  OF  BRAIN SCANNING WITH
MERCURY.

TURK J PEDIAT 7:22-30, JAN 65

*BRAIN NEOPLASMS;  GERIATRICS;  *MERCURY;
*RADIOISOTOPE SCANNING
```

Fig. 12 Card Format, MEDLARS Demand Search Bibliography.

Los Angeles: Biomedical Library

The bibliography which you have received is a product of MEDLARS, a computer-based information storage and retrieval system. While the system is in its developmental phase all information concerning the operation is of value to its future success.

As a user of MEDLARS you are in a position to provide both general and specific criticism of the systems output. Since this is the area of most vital interest to you, we should greatly appreciate your comments on the attached appraisal form.

Although this form lists certain major areas which can be evaluated by checking the appropriate box, we have left space for more general comments, and we hope that you will consider giving us the fullest evaluation possible.

Again we should like to stress that you, the user, can provide the most important feedback to the system; this is what we particularly need now during the developmental stage.

Thank you for your cooperation.

MEDLARS Search Station
Biomedical Library
University of California,
Los Angeles

Fig. 13 Request for Evaluation of a MEDLARS Search.

general and specific criticism." It is important to point out to the requesters that we are not going to be able to improve the system or our services unless we have feedback from them on how the searches meet their needs.

Figure 14 shows the evaluation form itself. We try to make it as easy as possible to fill out. We ask if the requester received more, less, or approximately what he expected. Was the search too broad, was it too narrow, or were there other things wrong with it? Does the requester know of citations not retrieved? If, e.g., you are doing a search for an investigator in a narrow field, or in any area where he is an expert, he is likely to know about people who have written papers that are missing. What is the approximate number of citations not relevant to the search? We want to know about both retrieval and relevancy based, if possible, on actual examination of the articles. Feedback based on an examination of the references is much more valuable than opinion stemming primarily from evaluation of citation titles.

Then we ask: "In your opinion, what may have caused retrieval of the nonrelevant citations?" Does the requester think the choice of descriptors poor, the search formulation incorrect or inexact, etc.? We also want to know if the requester has received the information on time. Finally, on the back, there is room for additional comments.

Naturally, we get the best feedback from the people who are users of the Biomedical Library, either at UCLA or in the Southern California area. One obvious advantage here is that personal contact allows for long interviews and for follow-up questions if necessary before the search formulation is completed. Thus the feedback is likely to be more specific.

Now, let us look at the list of search titles (Appendix). These represent requests that have come to us through April, including a few that were rejected and some which were done manually.

Some of these requests sound too broad to be practical because they would retrieve entirely too many citations. In most instances that is because the title of the request does not give full detail. The list will give you an idea, though, of the kind of questions that are asked. And we have been able to work out satisfactory formulations for practically all of them.

No. 17, "Physiological Regulation of Acid-Base Equilibrium," is a very broad question, but the investigator wanted it because he was writing a

NAME________________________

SEARCH NUMBER______________

DATE OF APPRAISAL_________

UNIVERSITY OF CALIFORNIA, LOS ANGELES
BIOMEDICAL LIBRARY
MEDLARS Search Station

Appraisal of MEDLARS Search

Quantity

Was the number of citations received greater than ( ), less than ( ), or approximately equal to ( ) the number expected? Please note your analysis.

______Search conducted on too broad a selection of subjects.
______Search conducted on too narrow a selection of subjects.
______Other (Please specify)

Relevance

How many citations are you aware of which this search did not retrieve? ________. Please specify.

What is the approximate numbe of citations not relevant to your search? _______. Is this estima on actual examination of the articles? _______.

In your opinion, what may have caused retrieval of the non-relevant citations. (e.g., descriptors used, formulation of search for retrieval)

Timeliness

Did you receive the citations in time to be of use? _______. Do you have any comments on timeliness?

General Comments (Use reverse side if necessary)

Fig. 14 Form for Appraisal of a MEDLARS Search.

monograph for which he needed to review a large segment of the literature. About 2,000 citations were retrieved.

No. 41, "Patient Education in Clinics, Hospitals, and Health Facilities," is an experimental parallel manual and machine search to determine the differences obtained by one method compared with the other.

No. 64, "The Concept of Touch in Nursing," had to be returned. It's a very interesting idea, but there is no way to get at this subject; I don't know that articles have ever been written on it. In any case, you certainly can't get at it through the vocabulary of MEDLARS. We did check Psychological Abstracts, also, but did not find articles that seemed to be pertinent. We have asked the requester to give us a citation. This is a case where one citation might be the key to the whole question. It may, of course, be that no one has written on this subject.

No. 68 is an author search on W. F. Ganong. We did a manual search.

In general, it's not sensible to use MEDLARS for author searches, because this is a clerical process and machine time is too expensive to be used simply as a clerical assistant. The best searches are those which call on the coordinating indexing power of the MEDLARS System, which will bring out information not obtainable through the printed index. And, of course, as you know, the printed index averages two or three descriptors per citation, whereas the computer's store has eight to ten.

It should be noted, however, that while all of the authors are in the computer store, only the first three are printed. So, in some cases, if one needs to compile a complete bibliography on all of an author's publications, especially a younger man who may have been the umpteenth author in most of the papers he has to his credit, a machine search would help because the citations printed out in answer to the request would be known to be his even if not under his name. And as somebody said the other day at UCLA, the number of authors in a paper is rapidly becoming greater than the number of experimental animals reported.

We sent back "Sex Linked Behavior." There are no bounds, I would say, to that question.

No. 87, "A Cross-cultural Study of Premenstrual Tension," was also returned. There again, it's just not a search that is adapted for MEDLARS searching.

In no. 92, "Carbohydrate Chemistry," the requester had asked for a number of characteristics of certain types of carbohydrates, not for everything on the chemistry of this enormous group!

In general, in requests where all the pertinent articles are listed under a subject heading in the Index Medicus there would be no sense in making a machine search; the pages can simply be xeroxed and given to the requester.

For a requester connected with UCLA, our four reference librarians do manual searches, and we also do some manual searching for the off-campus medical community, but obviously, we can't do a great deal. We have never thus far done over a hundred and fifty or so bibliographical searches in a year. With MEDLARS, when we are in full operation, we should be able to do 25-30 searches a week with our present search staff, i.e., 2-1/2 people. We now average two to three searches a day. Searches, of course, can vary in preparation time from a few minutes to a few days.

It disappoints people that search processing is not instantaneous. I remember recently meeting someone in the hall who was very enthusiastic about the whole idea of using computers for information. He had a friend with him and he wanted to impress him with how fast these things could be done now at UCLA. I hated to have to say that it took us five hours to run through the search routines and that the 40 per cent betterment which would be realized over the next few months in planned improvements would in a year or two be consumed by increase in the size of the file, but those are the sad facts. So much for MEDLARS.

II. Science Information Centers and Science Information Analysis Centers.

MEDLARS search stations might in some respects be described as science information centers, but not as science analysis centers because NLM's goal in MEDLARS is to describe and control the literature through indexing, but not to synthesize nor to evaluate it.

The subject area of MEDLARS is also, of course, far broader in scope than is the field of a typical information center. An analysis center, according to the usage of the moment, evaluates through the writing of critical and/or state of the art reviews, and by selecting information for the data file on the basis of whether it is new information and whether it is valid information.

The evaluation function obviously requires participation of research scientists, as well as information specialists in the center.

We also tend to think of information centers of any kind as highly mechanized, usually computerized if they are of top rank, but this is in no sense true.

Some of the most effective centers are operated on a completely manual base. Examples are the Remote Area Conflict Information Center, the Radiation Effects Information Center and several more at Battelle Memorial Institute in Columbus where only a very few of its dozen or so information centers use a computer. Centers of both types, in addition to literature searching and answering technical questions, frequently produce regular reports and/or publications of one kind or another. Some centers also provide editorial service and other support for publication as is the case with the University of Washington Primate Information Center here. The question of document vs. information is less important in the biomedical field than in engineering and the physical sciences because the nature of living material makes it almost impossible to give any facts without a myriad of qualifications about the conditions under which the facts are valid. The difference in the success and the usefulness of the Handbook of Chemistry and Physics compared with the Handbook of Biological Data is a case in point. The biomedical or biological scientist in most cases wants the document which substantiates the fact. There are differences of opinion on this score about the need for information rather than documents in medical and biological information centers, but a good many scientists agree that in our area the question is to a fair extent academic.

As a rule an information center develops as an adjunct to a research institution or at least in response to research needs in a circumscribed field in a geographic location. This gives it a pool of scientists to draw upon for advice and to involve in the work of the center--or at least to attempt to involve! The Primate Information Center here is a very good example of this relationship. A somewhat similar example is the Brain Information Service at UCLA where work in the basic brain sciences is one of the most important research areas in the University. Investigators are associated in the Brain Research Institute. Since this organization also furnishes an excellent illustration of a specialized use of MEDLARS and a MEDLARS station, let us look at it more closely.

The UCLA Brain Information Service (BIS) was established in 1964 under contract with the National Institute of Neurological Diseases and Blindness as one of the NINDB neurological information centers. It is a cooperative effort of the Brain Research Institute and the Biomedical Library, with the aid of the Health Sciences Computing Facility. Its purpose is to provide rapidly, accurately and completely, information in the basic brain sciences to aid investigators and teachers in this field. The subject area of the Service encompasses neuroanatomy, neurophysiology, neuroendocrinology, neurochemistry and neuropharmacology. The literature of diagnosis and treatment of neurological diseases is not within its scope.

The first aspect of the Service is bibliographic--with the aid of an automated storage and retrieval system, bibliographies will be provided for topics within the fields covered on demand from scientists across the country. The bibliographies will be compiled by information specialists with both library and subject background who will edit the output of the computer search, and will augment it with a manual search where necessary. Advice is available from Brain Research Institute scientists who also assist in the training of the subject area specialists by admitting them to graduate courses, including them in the regular research conferences and by working closely with them on a variety of projects. The input of current citations is assembled from a core of the most actively used neurological journals directly on publication, from the monthly magnetic tapes received by the UCLA MEDLARS Station from NLM, and from biological publications not included in MEDLARS. Citations in bibliographies now being compiled by manual search are also being added to the computer store. Literature published prior to 1964 is being transferred from the Index Medicus to magnetic tape, beginning with the most recent years. By far the largest source is MEDLARS. MEDLARS type programs and strategy are also employed for computer search.

The second aspect of the Service is concerned with synthesis of information and of the literature of the basic neurological sciences through (1) stimulation of review writing by qualified investigators and (2) organization of workshops or small conferences at UCLA under the auspices of the BIS and the Brain Research Institute.

At the present time the Service is confining its activities, on an experimental basis, to aiding investigators in the UCLA Brain Research

Institute and in the laboratories of a few other institutions, but the outside group is growing right along. At the end of the year when the computer programs are in regular operation, the automated service should be ready to serve all suitably accredited investigators and teachers in the basic neurological sciences. Meanwhile, availability of certain manually compiled bibliographies of general interest will be noted from time to time in the neurophysiological literature. Routine services now provided by the information specialists are current awareness through monitoring current journals and new publications received in the Biomedical Library, the production of both one-shot demand and recurrent bibliographies, and miscellaneous reference service.

Having indicated what the Service consists of in general terms, let me go on to describe it in somewhat greater detail.

Figure 15 shows the organization of the Service. Dr. Victor Hall, Professor of Physiology, is Director of the BIS and Head of the Scientific Unit. Working with him is Dr. Peter Amacher, who is in charge of glossary development and programming. Both have administrative and clerical support.

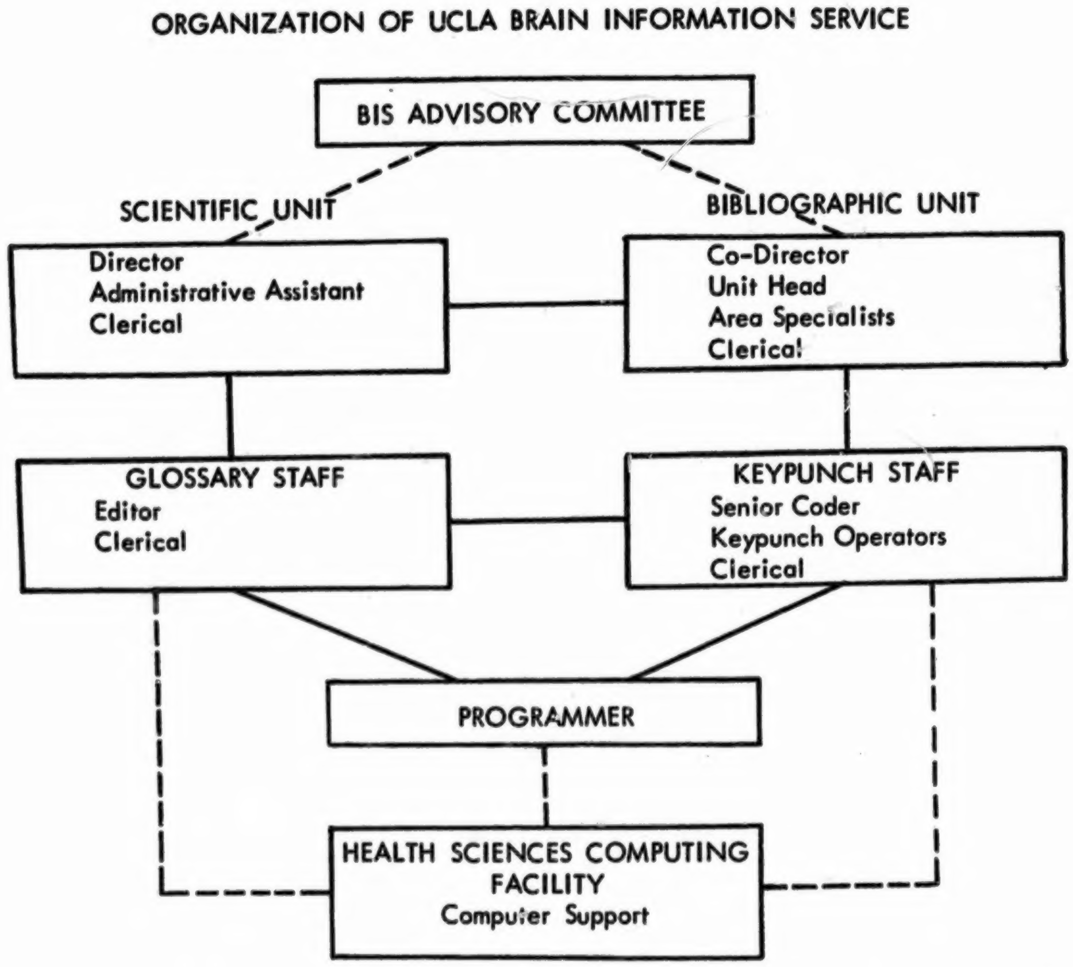

ORGANIZATION OF UCLA BRAIN INFORMATION SERVICE
BIS ADVISORY COMMITTEE
SCIENTIFIC UNIT
Director
Administrative Assistant
Clerical
BIBLIOGRAPHIC UNIT
Co-Director
Unit Head
Area Specialists
Clerical
GLOSSARY STAFF
Editor
Clerical
KEYPUNCH STAFF
Senior Coder
Keypunch Operators
Clerical
PROGRAMMER
HEALTH SCIENCES COMPUTING FACILITY
Computer Support

Fig. 15 Organization of the Brain Information Service, UCLA.

Looking now at the Bibliographic Unit we find an element of interest to us because the Unit is library based and functions as a special part of our public services activity. It has frequently been said that libraries are not information centers and that they cannot by their very nature become information centers. It is true that a general library cannot function in that fashion, but we think it feasible, and we hope we'll prove it feasible, that a special service working in conjunction with a group of scientists can be library based.

There are 4-1/2 area specialists, all with backgrounds in science and good to excellent facility with foreign languages. Three of them also hold the master's degree in librarianship. One of the more harrowing aspects of trying to run such a center is finding and retaining people with backgrounds adequate for the demands of the job. The scarcity of personnel of this type is acute, the competition for them tremendous.

Insofar as feasible, the area specialists are assigned to special groups in the Brain Research Institute. The head of the Bibliographic Unit, in addition to her administrative responsibilities, works with the space biology group, another with the neuroendocrine group, a third with the "sleep group" and a fourth handles assignments dealing with the neurochemical literature, but all cover additional areas as the need arises. They attend the regularly scheduled conferences of their groups and observe in the laboratories when important experiments are under way.

When the BIS bibliographic service first started, interest among potential users in the Brain Research Institute was, for the most part, lukewarm, especially among those working in the basic sciences. Basic sciences investigators as a whole usually don't feel that the library staff can do too much to aid them in their research fields, although if they are looking up historical material or have a casual interest in something not in their fields, they often ask for our assistance. On the other hand, the clinical people and the psychiatrists tend to call on us for all types of bibliographic service. Thus it has been interesting to see that now, as basic scientists in the BRI work with the area specialists and find that they really have an intelligent general understanding of what the researchers are doing, the latter are coming to rely on the help of the area specialists and to count on the weekly alerting service. We feel we are building up a fine rapport, but, here again, if present staff were to leave without adequate replacements the rapport would be lost.

We have a large keypunch staff section with a senior coder in charge of operations. She also functions as a link between the programming staff and the Bibliographic Unit.

As mentioned before, one of the responsibilities of the Scientific Unit is to sponsor and organize small workshop type conferences on specific new areas of research interest in the brain field. The published outcome of the workshop is a critical review written by the chairman of the conference in collaboration with the rest of the group. The Bibliographic Unit supports this activity as well as the writing of reviews by individual investigators with literature searching and the furnishing of hard copy for all the articles that the writers of the reviews wish. It is rather generally agreed that often about half of the time which goes into writing a review is spent on assembling references and then locating the papers for examination. We have also been told that if these tasks did not have to be performed by the investigator, he would be more willing to devote time to the writing of reviews. Our limited experience with the BIS indicates that this is true.

Figure 16 shows the input to the computer file. Right now our service is manual because the computer programs are still in the testing stage. The first source for our compressed citation file is MEDLARS. Programs have been written to convert the MEDLARS citations into the format that is used in the Brain Information Service. Then we are keypunching the *Index Medicus* for 1960 through 1963, under the subject headings that are important to the brain sciences. Selection is done by the scientific staff. Both selection and keypunching are enormous jobs. One of the biggest difficulties in this process of automation is the time and the care required to keypunch the input; keypunching takes longer than typing, and a mistake causes a lot more trouble than a typographical error. Later we plan to add other retrospective material, but, as the next slide shows, we are not yet quite two-thirds through the three years of *Index Medicus* which precede the MEDLARS store.

The area specialists index immediately on receipt a small core of about 25 journals which come by air, and add the citations to the BIS file many weeks in advance of their availability from MEDLARS. We believe the earlier

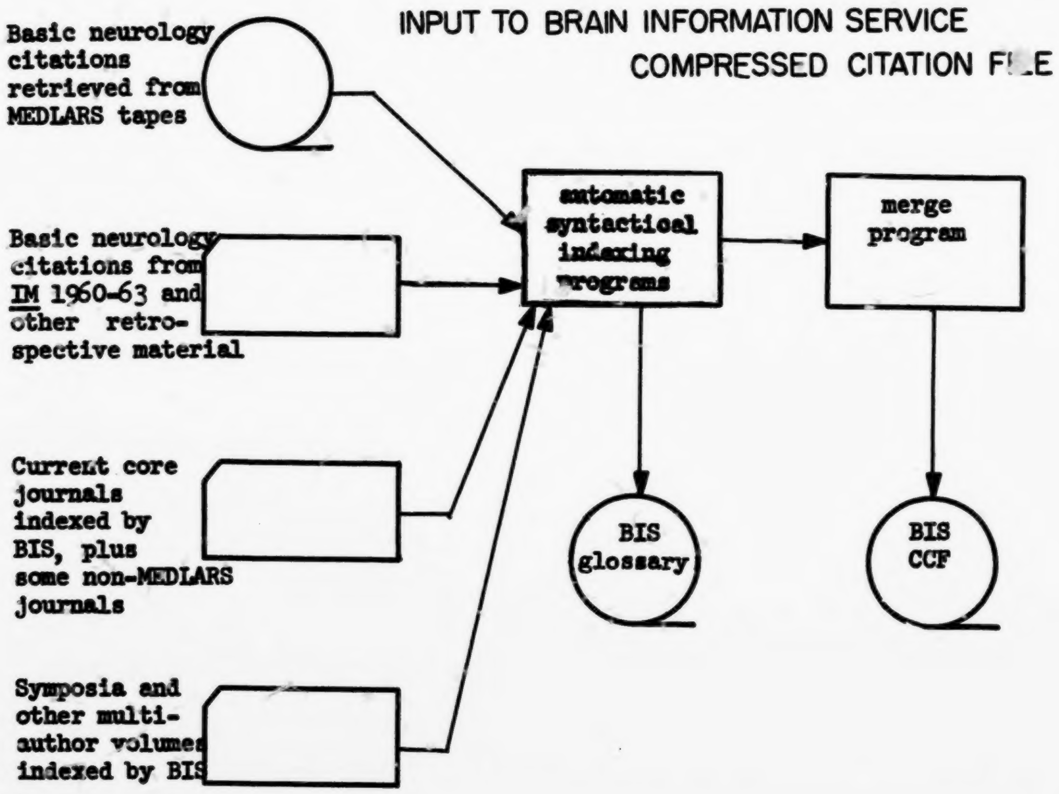

INPUT TO BRAIN INFORMATION SERVICE
COMPRESSED CITATION FILE
Basic neurology citations retrieved from MEDLARS tapes
Basic neurology citations from IM 1960-63 and other retro-spective material
Current core journals indexed by BIS, plus some non-MEDLARS journals
Symposia and other multi-author volumes indexed by BIS
automatic syntactical indexing programs
merge program
BIS glossary
BIS CCF

Fig. 16 Input for Brain Information Service Computer Store.

availability more than justifies the duplication of this primary nucleus and plan to increase its size to 50.

We also index a limited number of symposia and other multi-author volumes which, as you know, are not handled regularly by any published service. When these items begin to appear in MEDLARS BIS will, of course, drop this specific indexing.

We are developing our own glossary for which we are using the natural language approach. Computer programs control the vocabulary by relating synonyms, but requests may be formulated in almost any terms. This approach is experimental and we cannot at this point predict its level of success, but there is a project in surgical pathology at UCLA which is proceeding along this line with very good results. It must be noted, however, that the emphasis of this project thus far has been on tissue pathology which has a very limited vocabulary compared with the basic brain sciences. Input from the four sources shown in the slide are processed, terms extracted from the titles for the glossary, and the citations merged, duplicate citations being deleted automatically. From these procedures the Brain Information Service compressed citation file is produced.

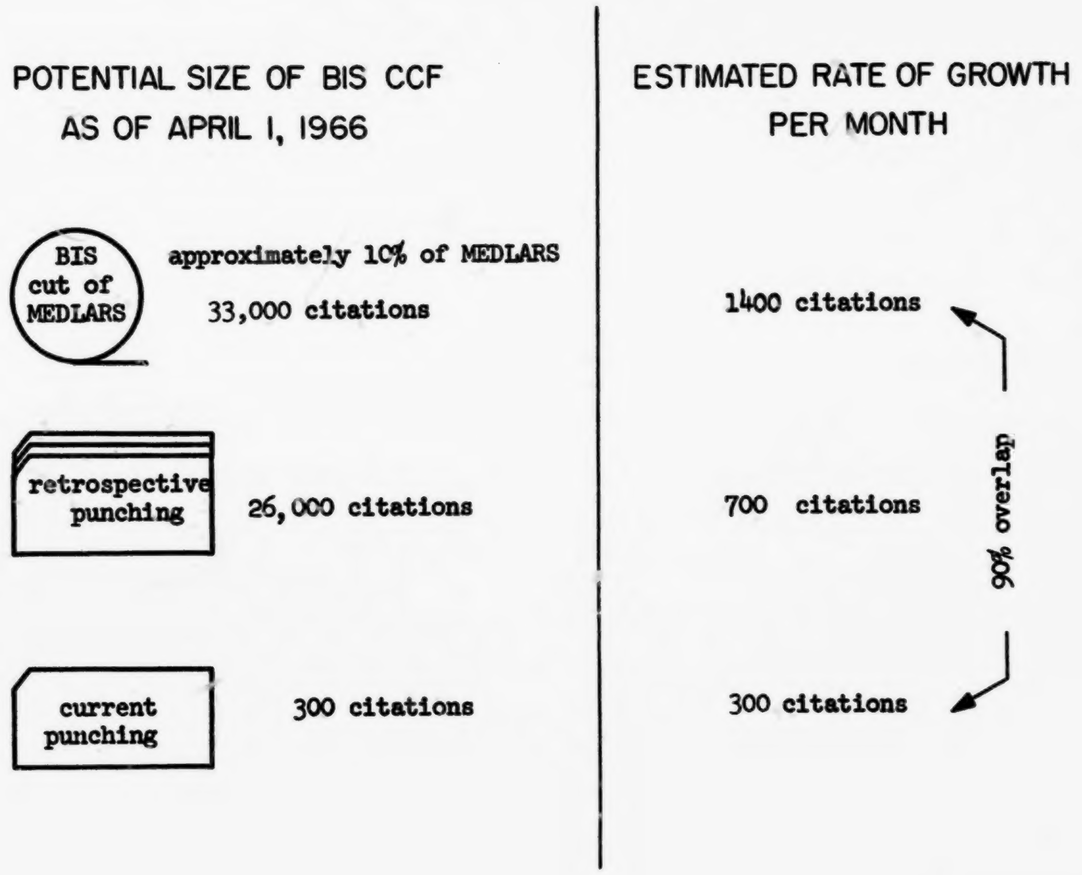

POTENTIAL SIZE OF BIS CCF
AS OF APRIL 1, 1966
ESTIMATED RATE OF GROWTH
PER MONTH
BIS
cut of
MEDLARS
approximately 10% of MEDLARS
33,000 citations
1400 citations
retrospective
punching
26,000 citations
700 citations
90% overlap
current
punching
300 citations
300 citations

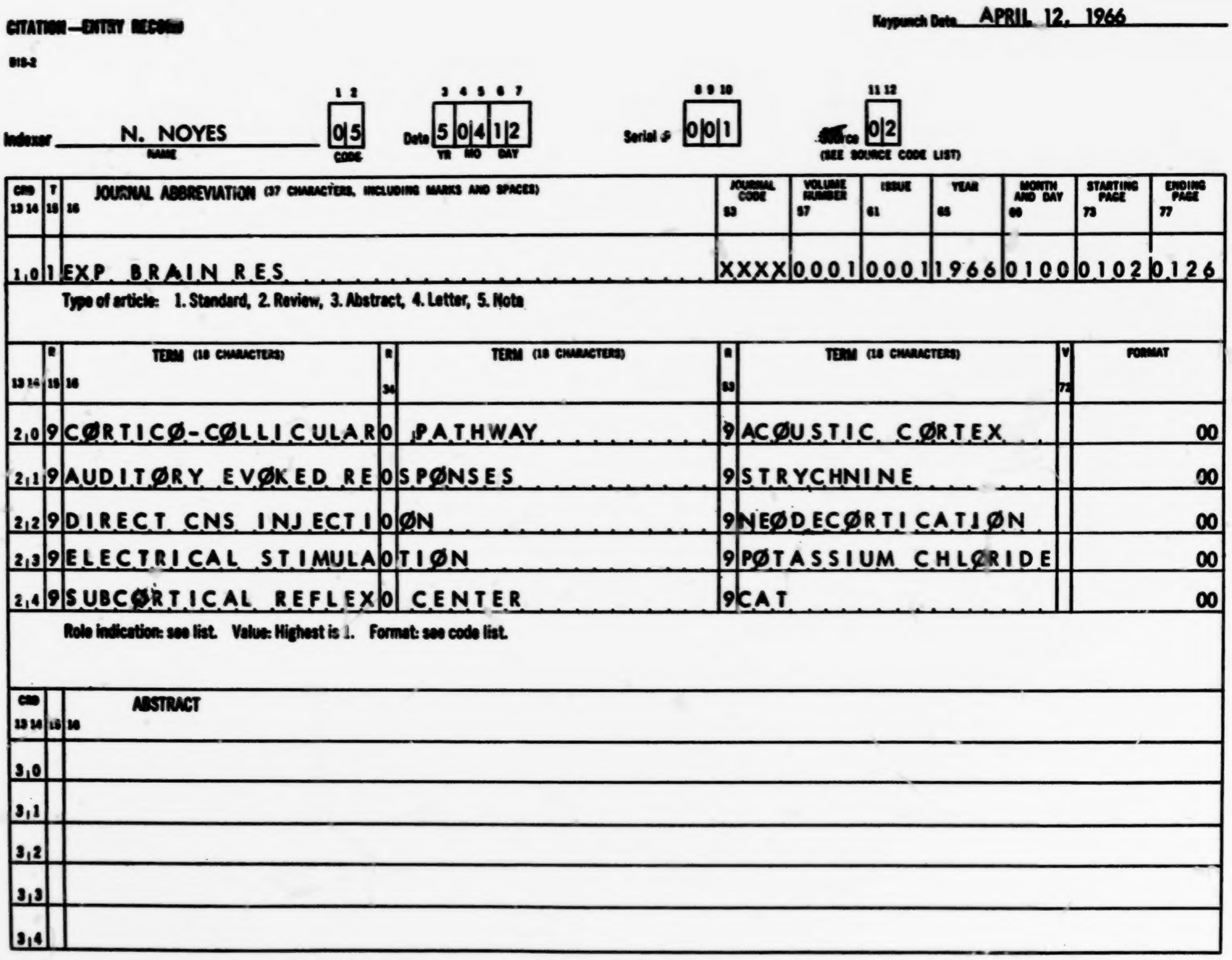
Fig. 17 Size and Growth of Brain Information Service Computer Store.

It is difficult to name an exact figure, but approximately 10 per cent of the citations in the MEDLARS file are of interest in the brain sciences field (Fig. 17). We have punched 26,000 citations and currently are adding about 300 citations from our own indexing, either from the core journals or from the bibliographies which we are preparing right along for people in the Brain Research Institute and for non-UCLA users. The estimated rate of growth of this file is determined, of course, by our budget. We should pick up about 1,400 citations a month from MEDLARS plus about 700 from retrospective punching. The 90 per cent overlap between MEDLARS citations and those derived from our current punching must be tolerated because of the importance of timing.

The next three slides relate to the making of the glossary.

Figure 18a is the citation entry form which we give to the keypuncher. It provides space for an abstract which in some cases is added. Here again, we are limited by the cost of keypunching.

Figure 18b shows that the Brain Information Service computer programs allow for printing out every author name, even the 40th! We use the



CITATION—ENTRY RECORD

BIS-2

Keypunch Date APRIL 12, 1966

Indexer N. NOYES (NAME) | 1 2 CODE 05 | Date 3 4 5 6 7: 5 04 12 (YR MO DAY) | Serial # 8 9 10: 001 | Source 11 12: 02 (SEE SOURCE CODE LIST)

CRD 13 14	T 15	JOURNAL ABBREVIATION (37 CHARACTERS, INCLUDING MARKS AND SPACES) 16	JOURNAL CODE 53	VOLUME NUMBER 57	ISSUE 61	YEAR 65	MONTH AND DAY 69	STARTING PAGE 73	ENDING PAGE 77
1,0	1	EXP. BRAIN RES.	XXXX	0001	0001	1966	0100	0102	0126

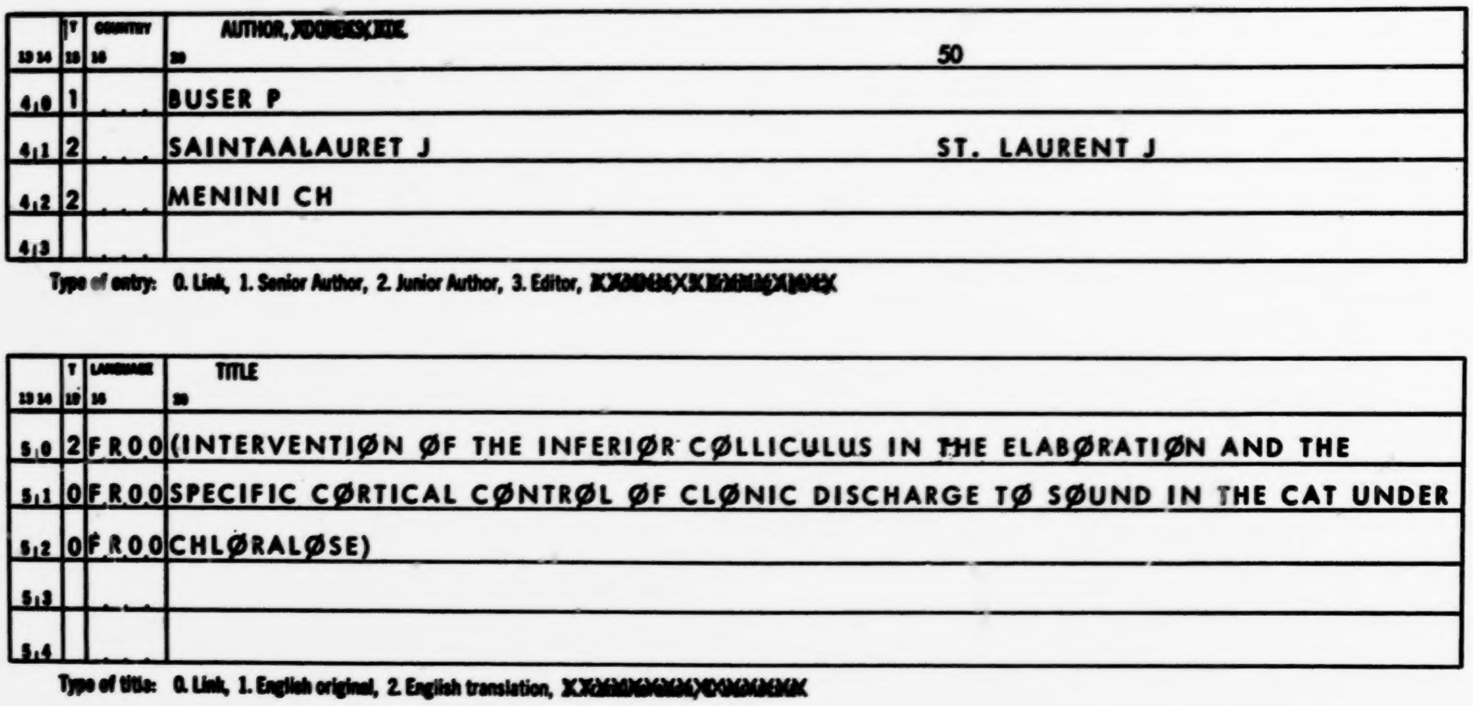
Type of article: 1. Standard, 2. Review, 3. Abstract, 4. Letter, 5. Note

13 14	R 15	TERM (18 CHARACTERS) 16	R 34	TERM (18 CHARACTERS)	R 53	TERM (18 CHARACTERS)	V 72	FORMAT
2,0	9	CØRTICØ-CØLLICULAR	0	PATHWAY	9	ACØUSTIC CØRTEX		00
2,1	9	AUDITØRY EVØKED RE	0	SPØNSES	9	STRYCHNINE		00
2,2	9	DIRECT CNS INJECTI	0	ØN	9	NEØDECØRTICATIØN		00
2,3	9	ELECTRICAL STIMULA	0	TIØN	9	PØTASSIUM CHLØRIDE		00
2,4	9	SUBCØRTICAL REFLEX	0	CENTER	9	CAT		00

Role indication: see list. Value: Highest is 1. Format: see code list.

CRD 13 14	15	ABSTRACT 16
3,0		
3,1		
3,2		
3,3		
3,4		

Fig. 18, a Citation Entry Record for Brain Information Service.



13 14	T 15	COUNTRY 16	AUTHOR, XXXXXXX 20	50
4,0	1	...	BUSER P	
4,1	2	...	SAINTAALAURET J	ST. LAURENT J
4,2	2	...	MENINI CH	
4,3		...		

Type of entry: 0. Link, 1. Senior Author, 2. Junior Author, 3. Editor, XXXXXXXXXXXXXXX

13 14	T 15	LANGUAGE 16	TITLE 20
5,0	2	FR00	(INTERVENTIØN ØF THE INFERIØR CØLLICULUS IN THE ELABØRATIØN AND THE
5,1	0	FR00	SPECIFIC CØRTICAL CØNTRØL ØF CLØNIC DISCHARGE TØ SØUND IN THE CAT UNDER
5,2	0	FR00	CHLØRALØSE)
5,3		...	
5,4		...	

Type of title: 0. Link, 1. English original, 2. English translation, XXXXXXXXXXXXXXX

Fig. 18, b Citation Entry Record for Brain Information Service.

vernacular title, whereas MEDLARS in demand searches uses English titles. BIS also gives the English translation and, for titles in the Cyrillic alphabet and for Japanese and Chinese the transliterated title.

Figure 18c contains information about the granting agency. The lower third of the form is used for our current awareness service. Through another program we notify the scientist whose name appears here of the existence of the article.

Figure 19 is the flow chart of the computer system for the Brain Information Service.

Figure 20 pertains to glossary formation. In addition to indexing done by the area specialists using words in the text or from standard sources, there is a BIS program for extracting words from titles or from abstracts. Even though titles are becoming more helpful, indexing words extracted from abstracts are likely to be more informative. The program extracts single words or words in pairs, deleting a group of 127 words such as "studies," "history," etc., as well as prepositions and articles. Automatic extraction produces a very large number of terms which must be related by synonymy in a hierarchical structure.

The next group of slides illustrate glossary features. "Major synonym" might better be called "preferred term" since it is the term on which the computer will search.

While Figure 20 showed a portion of the alphabetic glossary, Figure 21 exhibits the numeric. The glossary is known by the unfortunate acronym "BISH" for Brain Information Subject Headings."

Figure 22 contains warnings to the editor: e.g., if a term from a title card is not in the BISH, the editor has then to decide whether to put it in as a synonym or the preferred term. He must make a decision on each new word as it turns up and place it in the hierarchy as illustrated in Figure 23; it is through the hierarchy that the vocabulary is controlled automatically.

As you can see, by far the largest source in our file is from MEDLARS and we also employ MEDLARS programs and search strategy in searching, so there is a very close relationship between the two projects. The smaller, more specialized service aims to make as full use as possible of the larger, general service and to avoid all unnecessary duplication.

CITATION-ENTRY RECORD (CONTINUED)

1314	15	16-19	20 INSTITUTION ADDRESS OR GRANTING AGENCY
80	1		(LAB. NEURØPHYSIØL. CØMPAREE, FAC. SCIS, PARIS, FRANCE)
81			
82			
83			

Type of entry: 1. INSTITUTION ADDRESS, 2. GRANTING AGENCY, O. CONTINUATION SYMBOL

1314	15	Lang. 16-19	20 TITLE (VERNACULAR OR TRANSLITERATION)
60	1	FR00	INTERVENTIØN DU CØLLICULUS INFERIEUR DANS L'ELABØRATIØN ET LE CØNTRØLE
61	0	FR00	CØRTICAL SPECIFIQUE DES DESCHARGES CLØNIQUES AU SØN CHEZ LE CHAT SØUS
62	0	FR00	CHLØRALØSE
63			
64			

Type of entry: 1. VERNACULAR, 2. TRANSLITERATION, O. CONTINUATION SYMBOL

1314	Blank 15-19	20 SCIENTIST'S NAME
90		
91		
92		
93		
94		

Fig. 18, c Citation Entry Record for Brain Information Service.

BIS INPUT PROGRAMS

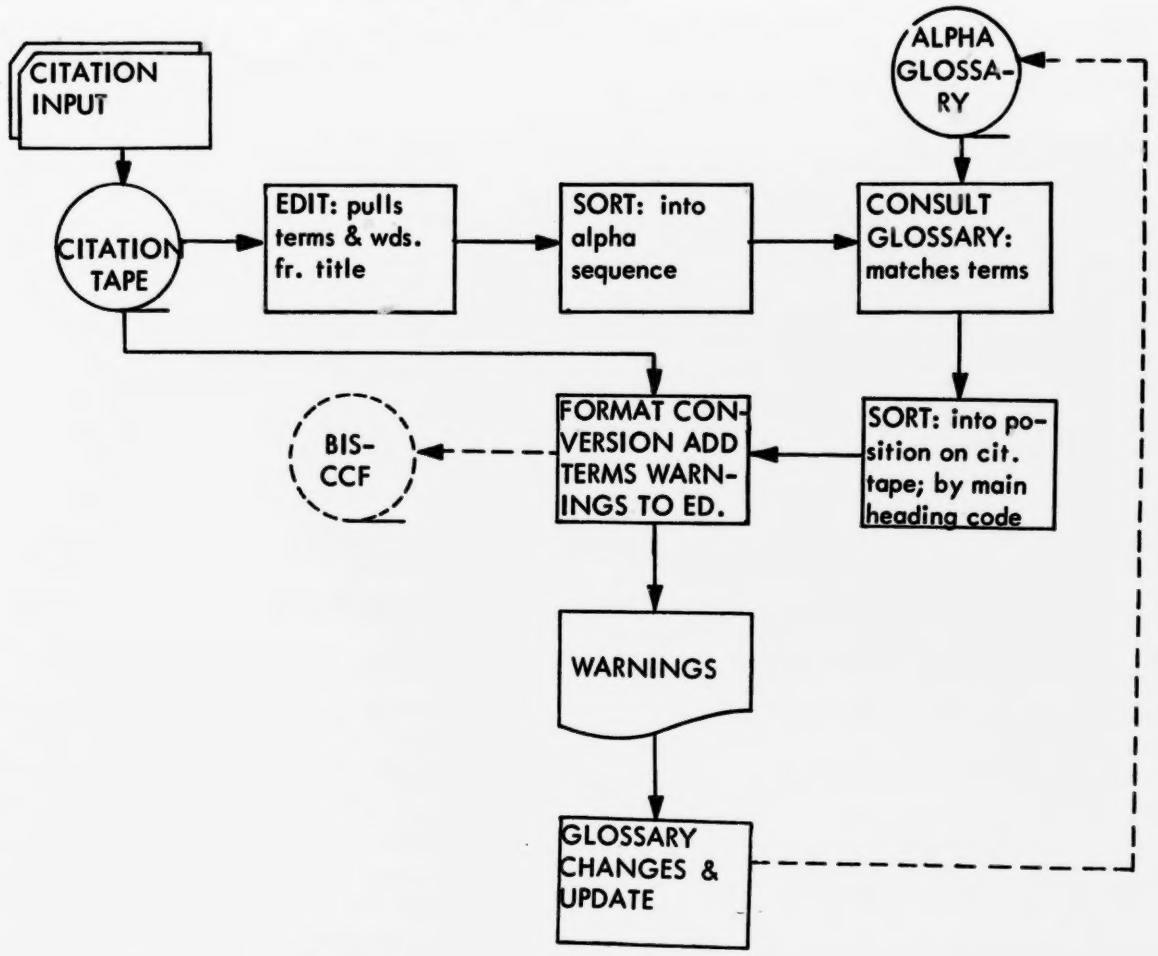
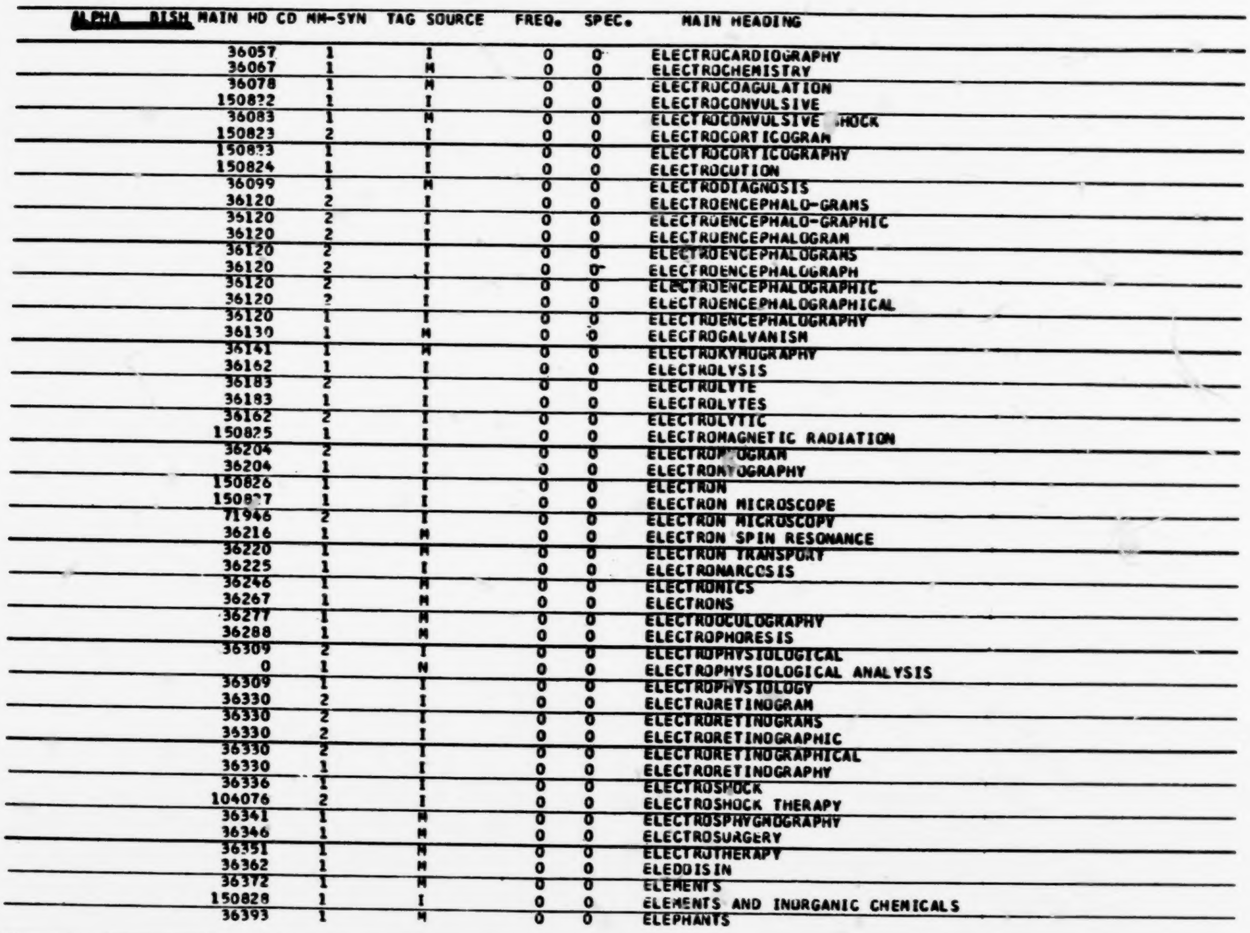

CITATION INPUT
CITATION TAPE
EDIT: pulls terms & wds. fr. title
SORT: into alpha sequence
ALPHA GLOSSARY
CONSULT GLOSSARY: matches terms
SORT: into position on cit. tape; by main heading code
FORMAT CONVERSION ADD TERMS WARNINGS TO ED.
BIS-CCF
WARNINGS
GLOSSARY CHANGES & UPDATE

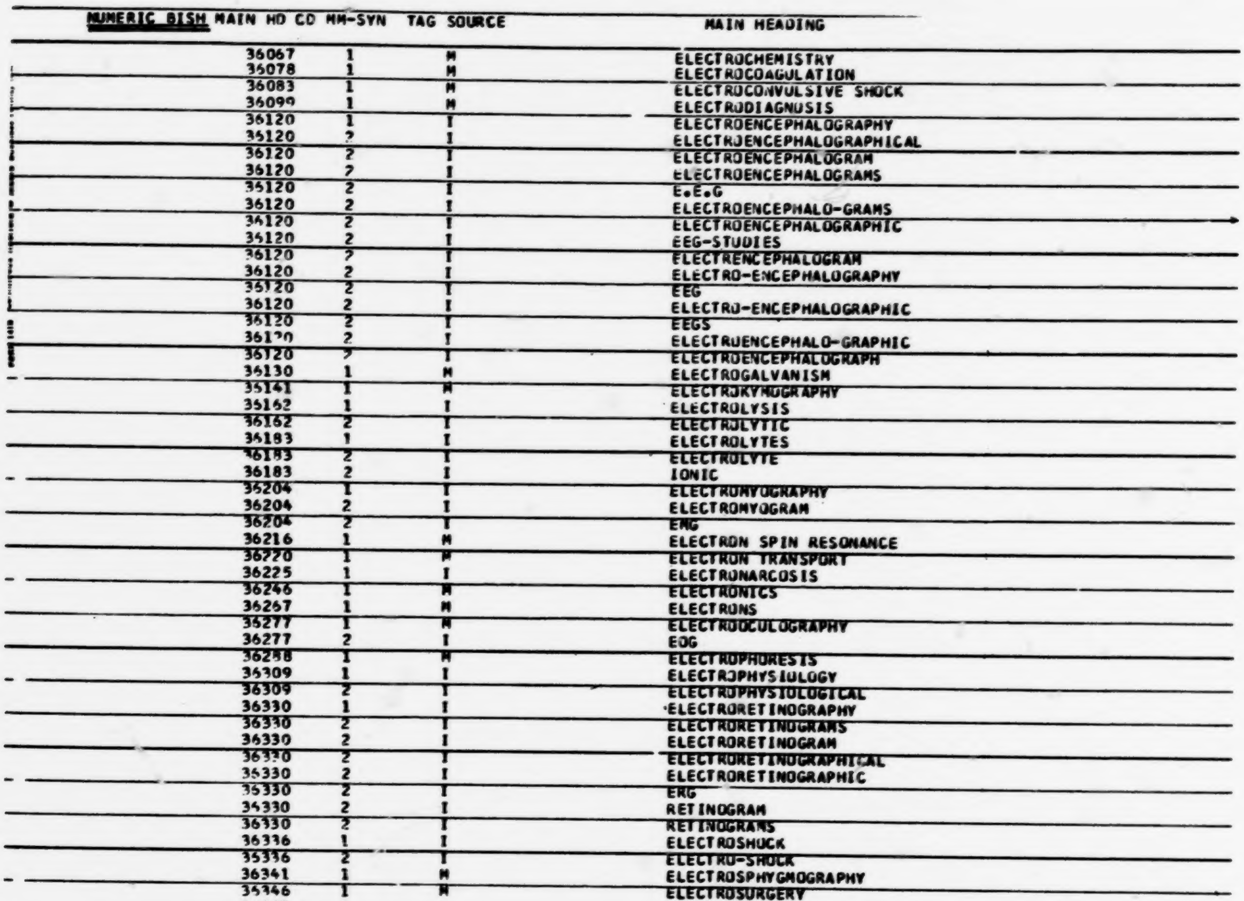
Fig. 19 Flow Chart Showing BIS Programs for Input and Glossary Formation.



```
ALPHA   BISH MAIN HD CD MM-SYN  TAG SOURCE   FREQ.  SPEC.     MAIN HEADING

            36057      1          I            0      0      ELECTROCARDIOGRAPHY
            36067      1          M            0      0      ELECTROCHEMISTRY
            36078      1          M            0      0      ELECTROCOAGULATION
           150822      1          I            0      0      ELECTROCONVULSIVE
            36083      1          M            0      0      ELECTROCONVULSIVE SHOCK
           150823      2          I            0      0      ELECTROCORTICOGRAM
           150823      1          I            0      0      ELECTROCORTICOGRAPHY
           150824      1          I            0      0      ELECTROCUTION
            36099      1          M            0      0      ELECTRODIAGNOSIS
            36120      2          I            0      0      ELECTROENCEPHALO-GRAMS
            36120      2          I            0      0      ELECTROENCEPHALO-GRAPHIC
            36120      2          I            0      0      ELECTROENCEPHALOGRAM
            36120      2          I            0      0      ELECTROENCEPHALOGRAMS
            36120      2          I            0      0      ELECTROENCEPHALOGRAPH
            36120      2          I            0      0      ELECTROENCEPHALOGRAPHIC
            36120      2          I            0      0      ELECTROENCEPHALOGRAPHICAL
            36120      1          I            0      0      ELECTROENCEPHALOGRAPHY
            36130      1          M            0      0      ELECTROGALVANISM
            36141      1          M            0      0      ELECTROKYMOGRAPHY
            36162      1          I            0      0      ELECTROLYSIS
            36183      2          I            0      0      ELECTROLYTE
            36183      1          I            0      0      ELECTROLYTES
            36162      2          I            0      0      ELECTROLYTIC
           150825      1          I            0      0      ELECTROMAGNETIC RADIATION
            36204      2          I            0      0      ELECTROMYOGRAM
            36204      1          I            0      0      ELECTROMYOGRAPHY
           150826      1          I            0      0      ELECTRON
           150827      1          I            0      0      ELECTRON MICROSCOPE
            71946      2          I            0      0      ELECTRON MICROSCOPY
            36216      1          M            0      0      ELECTRON SPIN RESONANCE
            36220      1          M            0      0      ELECTRON TRANSPORT
            36225      1          I            0      0      ELECTRONARCOSIS
            36246      1          M            0      0      ELECTRONICS
            36267      1          M            0      0      ELECTRONS
            36277      1          M            0      0      ELECTROOCULOGRAPHY
            36288      1          M            0      0      ELECTROPHORESIS
            36309      2          I            0      0      ELECTROPHYSIOLOGICAL
                0      1          M            0      0      ELECTROPHYSIOLOGICAL ANALYSIS
            36309      1          I            0      0      ELECTROPHYSIOLOGY
            36330      2          I            0      0      ELECTRORETINOGRAM
            36330      2          I            0      0      ELECTRORETINOGRAMS
            36330      2          I            0      0      ELECTRORETINOGRAPHIC
            36330      2          I            0      0      ELECTRORETINOGRAPHICAL
            36330      1          I            0      0      ELECTRORETINOGRAPHY
            36336      1          I            0      0      ELECTROSHOCK
           104076      2          I            0      0      ELECTROSHOCK THERAPY
            36341      1          M            0      0      ELECTROSPHYGMOGRAPHY
            36346      1          M            0      0      ELECTROSURGERY
            36351      1          M            0      0      ELECTROTHERAPY
            36362      1          M            0      0      ELEDOISIN
            36372      1          M            0      0      ELEMENTS
           150828      1          I            0      0      ELEMENTS AND INORGANIC CHEMICALS
            36393      1          M            0      0      ELEPHANTS
```

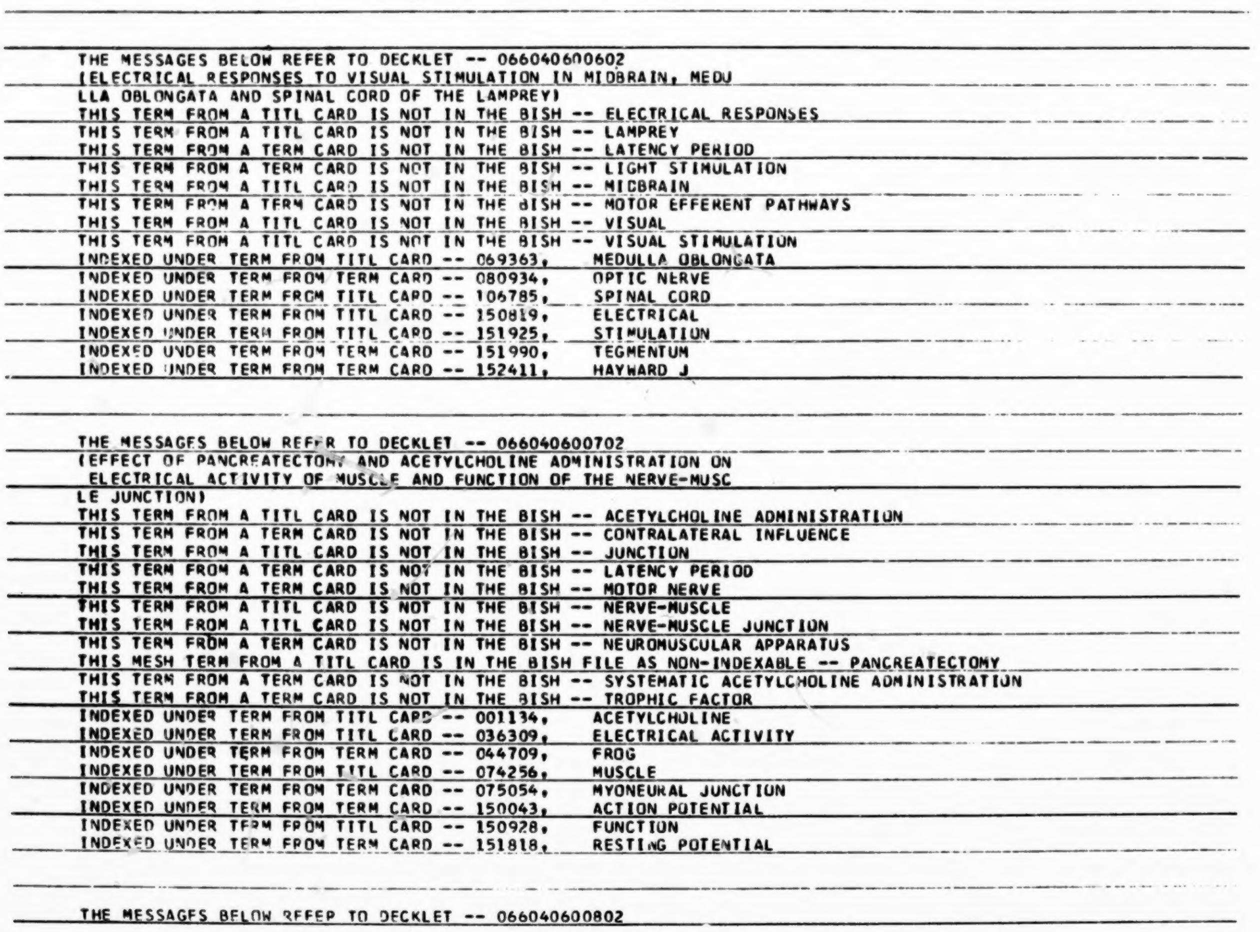
Fig. 20 Print-out from the Alphabetical Section of the BIS Glossary (BISH).



```
NUMERIC BISH MAIN HD CD MM-SYN  TAG SOURCE                  MAIN HEADING

               36067      1          M                    ELECTROCHEMISTRY
               36078      1          M                    ELECTROCOAGULATION
               36083      1          M                    ELECTROCONVULSIVE SHOCK
               36099      1          M                    ELECTRODIAGNOSIS
               36120      1          I                    ELECTROENCEPHALOGRAPHY
               36120      2          I                    ELECTROENCEPHALOGRAPHICAL
               36120      2          I                    ELECTROENCEPHALOGRAM
               36120      2          I                    ELECTROENCEPHALOGRAMS
               36120      2          I                    E.E.G
               36120      2          I                    ELECTROENCEPHALO-GRAMS
               36120      2          I                    ELECTROENCEPHALOGRAPHIC
               36120      2          I                    EEG-STUDIES
               36120      2          I                    ELECTRENCEPHALOGRAM
               36120      2          I                    ELECTRO-ENCEPHALOGRAPHY
               36120      2          I                    EEG
               36120      2          I                    ELECTRO-ENCEPHALOGRAPHIC
               36120      2          I                    EEGS
               36120      2          I                    ELECTROENCEPHALO-GRAPHIC
               36120      2          I                    ELECTROENCEPHALOGRAPH
               36130      1          M                    ELECTROGALVANISM
               36141      1          M                    ELECTROKYMOGRAPHY
               36162      1          I                    ELECTROLYSIS
               36162      2          I                    ELECTROLYTIC
               36183      1          I                    ELECTROLYTES
               36183      2          I                    ELECTROLYTE
               36183      2          I                    IONIC
               36204      1          I                    ELECTROMYOGRAPHY
               36204      2          I                    ELECTROMYOGRAM
               36204      2          I                    EMG
               36216      1          M                    ELECTRON SPIN RESONANCE
               36220      1          M                    ELECTRON TRANSPORT
               36225      1          I                    ELECTRONARCOSIS
               36246      1          M                    ELECTRONICS
               36267      1          M                    ELECTRONS
               36277      1          M                    ELECTROOCULOGRAPHY
               36277      2          I                    EOG
               36288      1          M                    ELECTROPHORESIS
               36309      1          I                    ELECTROPHYSIOLOGY
               36309      2          I                    ELECTROPHYSIOLOGICAL
               36330      1          I                    ELECTRORETINOGRAPHY
               36330      2          I                    ELECTRORETINOGRAMS
               36330      2          I                    ELECTRORETINOGRAM
               36330      2          I                    ELECTRORETINOGRAPHICAL
               36330      2          I                    ELECTRORETINOGRAPHIC
               36330      2          I                    ERG
               36330      2          I                    RETINOGRAM
               36330      2          I                    RETINOGRAMS
               36336      1          I                    ELECTROSHOCK
               36336      2          I                    ELECTRO-SHOCK
               36341      1          M                    ELECTROSPHYGMOGRAPHY
               36346      1          M                    ELECTROSURGERY
               36351      1          M                    ELECTROTHERAPY
               36362      1          M                    ELEDOISIN
```

Fig. 21 Print-out from the Numeric Section of BIS Glossary (BISH).



```
THE MESSAGES BELOW REFER TO DECKLET -- 066040600602
(ELECTRICAL RESPONSES TO VISUAL STIMULATION IN MIDBRAIN, MEDU
LLA OBLONGATA AND SPINAL CORD OF THE LAMPREY)
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- ELECTRICAL RESPONSES
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- LAMPREY
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- LATENCY PERIOD
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- LIGHT STIMULATION
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- MIDBRAIN
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- MOTOR EFFERENT PATHWAYS
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- VISUAL
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- VISUAL STIMULATION
INDEXED UNDER TERM FROM TITL CARD -- 069363,    MEDULLA OBLONGATA
INDEXED UNDER TERM FROM TERM CARD -- 080934,    OPTIC NERVE
INDEXED UNDER TERM FROM TITL CARD -- 106785,    SPINAL CORD
INDEXED UNDER TERM FROM TITL CARD -- 150819,    ELECTRICAL
INDEXED UNDER TERM FROM TITL CARD -- 151925,    STIMULATION
INDEXED UNDER TERM FROM TERM CARD -- 151990,    TEGMENTUM
INDEXED UNDER TERM FROM TERM CARD -- 152411,    HAYWARD J


THE MESSAGES BELOW REFER TO DECKLET -- 066040600702
(EFFECT OF PANCREATECTOMY AND ACETYLCHOLINE ADMINISTRATION ON
 ELECTRICAL ACTIVITY OF MUSCLE AND FUNCTION OF THE NERVE-MUSC
LE JUNCTION)
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- ACETYLCHOLINE ADMINISTRATION
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- CONTRALATERAL INFLUENCE
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- JUNCTION
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- LATENCY PERIOD
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- MOTOR NERVE
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- NERVE-MUSCLE
THIS TERM FROM A TITL CARD IS NOT IN THE BISH -- NERVE-MUSCLE JUNCTION
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- NEUROMUSCULAR APPARATUS
THIS MESH TERM FROM A TITL CARD IS IN THE BISH FILE AS NON-INDEXABLE -- PANCREATECTOMY
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- SYSTEMATIC ACETYLCHOLINE ADMINISTRATION
THIS TERM FROM A TERM CARD IS NOT IN THE BISH -- TROPHIC FACTOR
INDEXED UNDER TERM FROM TITL CARD -- 001134,    ACETYLCHOLINE
INDEXED UNDER TERM FROM TITL CARD -- 036309,    ELECTRICAL ACTIVITY
INDEXED UNDER TERM FROM TERM CARD -- 044709,    FROG
INDEXED UNDER TERM FROM TITL CARD -- 074256,    MUSCLE
INDEXED UNDER TERM FROM TERM CARD -- 075054,    MYONEURAL JUNCTION
INDEXED UNDER TERM FROM TERM CARD -- 150043,    ACTION POTENTIAL
INDEXED UNDER TERM FROM TITL CARD -- 150928,    FUNCTION
INDEXED UNDER TERM FROM TERM CARD -- 151818,    RESTING POTENTIAL


THE MESSAGES BELOW REFER TO DECKLET -- 066040600802
```

Fig. 22 Print-out of Warnings and Other Messages from the System to the BIS Glossary Editor.

A2B

ELECTRICAL RECORDINGS FROM BRAIN (See also BRAIN ELECTROPHYSIOLOGY 6)

- **EEG WAVES, ACTIVITIES, RHYTHMS AND COMPLEXES**
  - **SLOW-WAVE EEG**
    - **DELTA ACTIVITY**
      - **DELTA RHYTHM**
        - **DELTA WAVE**

    - **THETA ACTIVITY**
      - **THETA RHYTHM (Theta-rhythm**
        - **THETA WAVE**

  - **ALPHA ACTIVITY (See also ALPHA ATTENUATION)**
    - **ALPHA RHYTHM (Alpha-rhythm**
      - **ALPHA WAVE**
  - **BETA ACTIVITY**
    - **BETA RHYTHM**
      - **BETA WAVE**

    - **GAMMA ACTIVITY**
      - **GAMMA RHYTHM**
        - **GAMMA WAVE**

Fig. 23 Table Showing a Section from the BIS Glossary Hierarchy.

III. Translation Service

Many information centers furnish translation service through location of translations already available, through resident translators or by contracting work. The users may or may not pay a fee. Neither the BIS nor the Biomedical Library Reference staff have ever had more than moderate--and usually less than moderate--success in locating through published aids the translations users request. The Library keeps a file of translators unattached to the Library with whom users may deal. The BIS uses this file, and it also through one of its information specialists will do on-the-spot translations for users, but has not the time to undertake finished, written translations. We could very well use one full-time translator for this rough and ready type of translation. Finished translations probably should be obtained from outside sources by the investigator or on a fee basis through the BIS which would contract with outside sources. The cost of finished translations would probably make a regular fee service of this kind prohibitive.

IV. Electronic Transmission in Networks

Networks seem to be the thing currently, especially now that the third generation of computers is arriving and remote inquiry stations through consoles expected to be more widespread. A most interesting demonstration of future possibilities is the Technical Information Project (TIP) which is part of Project MAC at MIT. MAC (Multiple Access Computer), which is basically an IBM 7094 configuration, has been described as a regional public utility. It has 150 consoles of which 30 can now be used at one time to consult the TIP file which deals with the literature of physics--or at least a file of 35,000 papers growing at the rate of 1,200 papers a month which result from monitoring the papers and their bibliographies in 27 elite physics journals. I believe the TIP users are all at MIT locations, but this is immaterial.

Another exciting development for networks is LDX, Long Distance Xeroxing via leased telephone wire, and Magnafax, which are being experimented with on a limited scale. An example is the project of the University of California at Davis and the University of Nevada on a Council on Library Resources grant. The first transmission between the two via the Magnafax System took place last week, I am told. The costs, however, are still inordinately high for this type of linkage and many improvements in resolution and transmission time are required. Obviously, facsimile transmission, when and if feasible, will be a tremendous boon to regional medical library service. Ability to consult data files will also be a great asset, especially if abstracts, digests, or partial text extracts are included. For the latter, the limiting factor is the cost of preparing the input. Keypunching large amounts of text is almost out of the question, but if optical scanners are developed to read all kinds of type fonts the problem might be solved.

V. Personnel Needs and Training

The last item on my list is, as I said before, the most urgent--the training of personnel to handle information center functions in regional medical libraries and regional medical library networks. There have been a number of estimates of manpower needs for science information work in recent years, a recent estimate of medical library personnel needs alone giving 3,200 as the deficit, an annual attrition of 150, and about 100 a year in training. Of the latter, about 60 per cent are already employed in medical libraries. This means that only around 40 librarians a year are going into the medical library field. Moreover, regional medical libraries will need systems analysts, programmers, translators and information specialists, who may or may not be librarians, as well as line medical librarians. Finding systems analysts and programmers for libraries is at the moment an even more difficult task than finding librarians and information specialists. A core of well trained assistants at the technician rather than the professional level will also be required.

These needs have been widely known for at least the last half dozen years, but very little has been done to fill them. There literally are not people available to staff positions in the new medical library developments unless they are taken from places where they are equally needed. The library schools have not been able to ameliorate the problem to any appreciable degree and the few special schools for information work have produced very, very few graduates. Medical library internships have increased by one program since 1962--from 3 to 4--with more to be inaugurated next year. A very limited number of other post-masters training opportunities are opening up. This is all to the good, but the real need is to capture the graduating college senior for the biomedical information field. So far as I know, the NSF program at the

University of Illinois and the NLM approved University of Chicago program are the only efforts in this direction thus far, though at least one other program is in process of review for funding and there may be more. The MLA offers only one scholarship of any size for a library school student planning to go into the medical field.

There is no point in planning great programs without planning for people to man them--and we cannot expect government agencies both to support and to plan the programs. The support has been late in coming, but the grass-roots planning has scarcely appeared on the horizon. Librarians, library schools, and biomedical investigators and practitioners should feel equally concerned. Personnel administrators in universities and other institutions supporting biomedical libraries need also to be involved at least to the extent of setting up classifications for professional staff who are not librarians but are needed as members of library staffs.

Discussion

Q: What is the operating budget for such an installation?

MISS DARLING: MEDLARS stations will probably require annual operating budgets of $75,000 to $85,000, depending on workload and cost of machine time. Money for extra programming is required initially to set up the station--the equivalent of a half-time programmer's salary for the first year perhaps. Most of the budget is for salaries, including overhead charges. Costs of information center services of any kind are primarily costs for salaries.

Q: I would like to hear some discussion on the relationship of this program to the clinician, to the practitioner of medicine. This is our problem, closing the gap between research and the current medical knowledge. It strikes me in what I've heard this morning about the MEDLARS program that it will further widen this gap, rather than close it, because at the moment it's directed fully, as I see it, toward the researcher, not towards the practitioner.

MISS DARLING: Several of the requests we have received so far have come from practicing physicians, even during this testing period. Many practicing physicians, as you know, do have special research interests for which they would like to have bibliographical assistance. As we were saying earlier, we need to make it easy for the practicing physician to use the service; we need to be able to produce highly selective lists for him and probably to give him at least a sampling of hard copy at the time we give him the list. And we certainly, I think, will have to work through continuing education groups to get this information to him. But I think we all know from experience that in the geographic area of the medical centers which offer post-graduate courses, the practicing physicians do come to the library and do use it, sometimes just to read assigned materials, but often to use it in connection with their practice, with writing papers, etc. At UCLA we have about 400 outside people who are regular borrowers. But I agree that for the rank and file practitioner, we are going to have to make some special efforts and design special services, offered, perhaps, through community hospital libraries. I meant to imply all the way through that such services very definitely need to be developed for the practicing physician and not just for the investigator.

Q: I am very appreciative of this and I think perhaps we're dealing with two problems when we're talking about the needs of the researcher and the needs of the clinician, and I am not sure that we are fully recognizing these problems. Perhaps Dr. Cummings will clarify this for me in the discussion of our needs for continuing education, basic knowledge, current medical knowledge.

MISS DARLING: Could you describe what you think might be a good service?

Q: For example, a drug information service in which the physician need not be looking through PDR, for something that was created a year ago. We need to know now. We need to have immediate current information. The physician needs to know, for example, the current diagnostic methods that are available; he needs to know the interpretations of laboratory findings in relationship to his particular patient with a particular illness he has at this moment. He needs current authentic medical literature, almost a textbook of medicine which is updated every day if he is going to keep abreast.

MISS DARLING: We have been dwelling too much on the computer probably, but in any regional medical service there ought to be regular reference service (with advice from physicians attached to that center available) to answer questions of this kind with material sent either by xerox copy or interlibrary loan.

Q: I think we're rapidly approaching the phase when even this is inadequate. I think we're approaching the phase when this must be available to this practitioner, wherever located, immediately on some kind of a visual device, such as the IBM device that you've discussed. I think the time lag is too great; I think the pressure on our physicians are too great. With the rapidly expanding demand for physicians, our lack in medical manpower, we have to leap from the Bush Age to the Jet Age if we're going to bridge this gap. These are the concepts which we have to discuss.

MISS DARLING: Many times the immediacy of information is more important for the practitioner than it is for the researcher.

Q: Perhaps what I'm talking about is a different kind of a health science information service which is available to the professional group.

I think we are all acquainted with Poison Information Centers, I am sure, and if one would do a survey of the activities, the role and function of such a center today, at least in our area, Idaho, I would say that we have a long way to go before we really update and improve the use of this sort of service.

MISS DARLING: Would you think that something like the Poison Information Service is practical to tie in with regional medical library service?

Q: Absolutely.

MISS DARLING: You would think it acceptable to have the Poison Information Service in the building of a regional library center? This seems perfectly feasible to me, though the information in the center would have to be the responsibility of physicians--i.e., it would not be a library function _per se_.

Q: Yes. I see no reason why this shouldn't be part of the health science information service.

However, I think if we take advantage of modern computer technology, data storage and retrieval, transmission techniques, almost random access by flipping through the TV screen as one flips through the pages of a book, then there is no reason, really, to be concerned about where it's located; it's coming out of a system.

Q: Well, this implies that your regional library center is going to have to have its own wholly owned computer so that it can handle the wide range of information. And this is something that isn't in the program so far that I know of.

MISS DARLING: No, as I said at the outset, there are two and one-half million dollars available a year for starting a regional medical library service for the whole country, so what you're proposing is the ultimate goal which we must approach in steps.

Q: I think we should immediately get into this kind of demonstration projects. For example, we discussed this morning the geographic problems that we have in the Northwest, the wide distances between health centers, a thousand-mile gap, for instance, between Salt Lake City and Portland. And we in Boise, Idaho, are sitting right in the middle of it.

These distances can be bridged better by communications methods than transportation methods. We have not only the tremendous problem of increasing our rural practitioners, but the problem of just keeping the man there because every day he knows he's further behind in health information than he was the day before. These are problems we have to answer.

MISS DARLING: It seems to me the most important thing to do right now is to outline steps toward reaching what you are discussing. The costs would be out of the question now, anyway, and the technology really isn't ready except on an experimental basis. Computers are going faster and faster. The 91 Series of the 360 is supposed to take something like four million instructions in a second. Some systems may soon carry twelve million instructions per second, which would certainly give time sharing a boost. However, not much is being done about mass memory which has to be developed along with manipulative speed if we are going to have a lot of data available quickly.

Q: I think we need to develop systems engineers who could begin to match hardware to needs, rather than needs to hardware. I think this has been one of our problems in the application of computers. We have been the victims of hardware salesmen.

MISS DARLING: There certainly should be some experimentation in every regional center that's developed, along with the operating program focussed on the practical things which can be done now. We really have to go step by step. If we just keep talking about the ultimate, we aren't going to get there because we shall not have laid a roadway along which to travel there.

Q: What does a modern medical library look like? How does one start a library in 1966? Does it have books? Does it have current journals? What is it?

MISS DARLING: Well, a number of new medical libraries are in process of organization right now and all of them are planning on books, current journals and the other conventional components of medical libraries. At the same time they are looking seriously at the advantages, costs and general feasibility of automating library operations--cataloging, serials records, circulation control, etc. They are concerned with automatic information retrieval, too, but they know that within a year or so they will be expected to provide users with books and journals. Consequently their primary efforts are bent to this end.

There is an AAMC committee working on what a medical library should look like right now. Dr. DuVal of the University of Arizona is chairing this committee. Incidentally, his own School of Medicine is just starting a medical library and I know that its library staff is working feverishly to have a working collection of books, not consoles, ready for the first class which comes in 1967.

APPENDIX

MEDLARS Search Station
University of California
Los Angeles

Search Titles

1. The action of chemicals and drugs on respiration and the lungs.
2. Chromosomal factors in abortion.
3. Venous circulation of the dog's brain.
4. Transplantation and reimplantation of teeth in man.
5. Thalidomide toxicity in rabbits.
6. Effects of quitting smoking on consumption of food and alcohol.
7. Effects of genetics on response to anesthesia.
8. Effects of environment on response to anesthesia.
9. Pregnancy and pregnancy complications.
10. Complement fixation level in serum and in synovial fluid in diseased states.
11. Vacuum extractors in obstetrics.
12. Infertility surgery.
13. Chromosome studies in cancer.
14. Relaxation of spasms of the pyloros antrum of the stomach associated or not associated with organic disease of the stomach.
15. Mechanical support for circulation.
16. Birth order and mental health.
17. The physiological regulation of acid-base equilibrium. Its effects on circulation and renal acid excretion.
18. The measurement of gastric acid secretion in rabbits, rats, and guinea pigs.
19. Tritium labeled lymphocytes.
20. Lung physiology.
21. Fetal circulation.
22. Hyaline membrane disease.
23. Hypophysectomy and its surgical aspects.
24. Electron microscopy of structures of lymphocytes.
25. Long-acting thyroid stimulator in Grave's disease.

26. Arteritis or vasculitis following drug therapy.

27. Electron microscopy studies of rabbit kidney proximal tubials.

28. Mothers of unwanted children who keep their children.

29. The clinical appearance of the retina.

30. Melanoma--its statistics and prognosis.

31. Corticosteroids, ACTH and the adrenal function.

32. Light and electron microscopy of the reaction of cells to antiserum.

33. Electron microscopy of lymphocytes.

34. The presence and synthesis of RNA in spermatozoa.

35. The distribution of adrenal cortex hormones released by the adrenal gland.

36. The occurrence of sex specific proteins or enzymes in eggs and sperm, and sex specific responses of the brain and nerve tissue to a drug or chemical.

37. Electrophoretic behavior and immunology of pituitary gland hormones.

38. Cellular immunity with listeria, mycobacterium, brucella and salmonella.

39. The effects of caffein on the human pupil and on the refractive mechanism of the eye.

40. The measurement of the depth of the anterior chamber in human eyes after the surgical removal of the crystalline lens.

41. Patient education in clinics, hospitals and health facilities.

42. Myocardium and cardiac output.

43. Psychopharmacology and goats.

44. Alcoholics Anonymous.

45. Techniques and materials for body casts and musculo-skeletal fixation.

46. Electrolyte values and aldosterone, hyperaldosterone, myxedema, hypothyroidism.

47. Any cases reported of cholelithiasis subsequent of hemolytic anemia from insertion of a heart valve prosthesis.

48. Progesterone and temperature rise in women.

49. Vertebrate photoreceptors.

50. Encephalitis secondary to influenza viruses.

51. Death due to or following mumps.

52. The metabolic effects or consequences of exertion in males and females of all ages.

53. Hemodynamics and biogenic amines of the thyroid under the influence of TSH.

54. Placental hormones in pregnancy in animals.

55. Death as a result of the concomitant ingestion of meprobamate and alcohol.

56. Bladder function after rectal operations.

57. The impact of heart disease on the family.

58. Studies of the eye using electrophysiological techniques.

59. Mitral stenosis.

60. Current literature on the use of progesterone or progestational agents to prevent abortion.

61. Electron microscopy of the ultrastructures of brain tumors.

62. Adrenal cortex hormones in the fetus.

63. Development of peptic ulcers from changes in gastric secretion and estrogen deficiency in menopause and oophorectomy.

64. The concept of touch in nursing.

65. Non-print adrenal cortex hypofunction.

66. Decontamination of equipment used for inhalation anesthesia.

67. All references on the use of anti-depressants to treat schizophrenia.

68. An author search on W. F. Ganong.

69. The significance of pyelonephritis as a cause of death.

70. Hypothalamic control over thyrotropin and the relationship between thyrotropin and thyroxine.

71. Abnormal hemoglobins.

72. Congenital unilateral renal agencies.

73. The EEG and EMG.

74. The brain and learning.

75. The brain and feeding behavior.

76. Sex-linked behavior.

77. Fenocyclin (MDDA).

78. The study habits of medical doctors. Their means of learning about new developments in medicine.

79. Anti-androgenic activity in immature and mature male monkeys.

80. The effect of hypothermia on dreaming in the newborn.

81. The effects of narcotic agents and hypnotics on goldfish.

82. Appendicitis in acute leukemia in childhood.

83. The use of technetium as a scanning agent in medical and biological radioisotope studies.

84. Any anti-inflammatory agents showing greater anti-inflammation properties than acetylsalycilic acid or 1/10 butazolidin.

85. Hypophysectomy or decapitation of fetuses.

86. Aneuryism in bone; Cavernous hemangioma in bone.

87. A cross-cultural study of premenstrual tension.

88. Auto-immune anemia in pregnancy.

89. Testosterone in vivo and in vitro-mammals and man.

90. Steroids including sex hormones in schizophrenia and psychoses.

91. The mortality rate in the first three days after open heart surgery involving the aortic valve and/or the mitral valve.

92. Carbohydrate chemistry.

93. Suicide in age groups over 19.

94. Action of thyroid-stimulating hormone on hemodynamics and biogenic amines of the thyroid.

95. The significance of leukocytic clusters in vaginal or cervical smears in absence of trichomonas.

96. The physical and chemical causes of intra-uterine deformities in the middle ear.

97. Tight filum terminale.

98. The denervation of the lung.

99. The pulmonary toxicity of mercury fumes.

100. The chemical properties of mucus and its comparative properties in different sites.

101. The elastic properties of the lung.

102. The use of an electron probe for the measurement of various elements in any and all tissues and in all biological applications.

103. Radiation and skin grafts in mice.

104. Amino acids and the uterus and uterine protein.

105. Myocardium and coronary blood flow.

Group 3: QUANTITATIVE ASPECTS OF REGIONAL MEDICAL LIBRARY SERVICE

Elizabeth L. Keenan

As you are all well aware, Congress passed Public Law 89-291, better known as the Medical Library Assistance Act of 1965, on October 22, 1965, thereby enabling the Public Health Service to underwrite the nationwide improvement of medical libraries. One of the provisions of this law is to "assist in the development of a national system of regional medical libraries each of which would have facilities of sufficient depth and scope to supplement the services of other medical libraries within the region served by it."[1] To accomplish this, the law further states that sums not to exceed $2,500,000 per fiscal year may be appropriated and utilized for acquisitions, technical processing, duplicating equipment, transmission mechanisms and construction, renovation, rehabilitation or expansion of the physical plant. These grants may be made to existing public or private nonprofit medical libraries, providing said libraries agree "to modify and increase their library resources so as to be able to provide supporting services...[and] to provide free loan services to qualified users..."[2] Monies awarded for construction projects are contingent upon the facility remaining a medical library for the next twenty years.

I should like to discuss with you today some of the quantitative aspects of the planning which must be undertaken to establish a regional medical library service. The general topics to be considered are (1) the organizational and administrative facets of the national and regional systems, (2) the clientele to be served, (3) the services to be provided to the region, (4) the regional staff requirements, (5) the regional library collections, (6) transmission and data processing equipment and (7) the physical plant for the regional center. Since each region selected in the U.S. will be unique in certain characteristics, let us propose a plan for a typical medical library region, one which hypothetically will include most variables. Precise figures for expenditures do not lie within the scope of this paper, since this would involve a survey of the actual resources and services of a well defined medical library region.

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[1] U.S. Congress. Public Law 89-291, S. 597, October 22, 1965. p. 1.

[2] *Ibid.*, p. 7.

As you may have noticed, I have referred to the network as a medical library service, rather than a system. This I have done purposely, for I feel the main emphasis should be placed on the service given to the medical region. The quality of this service, of course, will depend upon a smoothly operating system which will enlist the cooperation and support of the participating institutions. This Service (with a capital S) should be freely and willingly given to all who seek it and should be offered to those who are unaware of its existence. Too many medical libraries today are in the self-service supermarket business and it is now time for us to offer the old-time country store service together with our data processing systems.

Neither regional library service nor regional medical library service are new concepts, some systems like those in operation in Philadelphia and Wisconsin, having been in existence for many years, but the major impetus for their development came in 1956 with the passage of the Library Services Act. A regional library service may be defined as an "association of libraries, based on geographical grouping and--[including] university and special as well as public libraries [with] the primary purpose...to meet the special requirements of the users of constituent libraries..."[3] The medical region, of course, would encompass the libraries in the area serving health science schools, hospitals, institutions and health related industrial concerns.

Most regions offering extended library service have entered into contractual agreements whereby each participating institution defines its role in and commitments to the entire operation. When several states enter an agreement, it is strongly advised that all contracts be identical in scope and in terminology in order to avoid confusion and subsequent misunderstandings.[4] Many contracts between public and state libraries have been voluntary and have worked to the satisfaction of all participants. Many other existing contracts, however, specify a paid membership, utilizing a sliding scale based on the participating institution's resources and income. Membership in such a regional library system is also dependent upon the institution's ability to meet specified standards in regard to its collection, personnel, equipment and services.

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[3] Sewell, P. H., The regional library systems. 2nd ed. London, The Library Association, 1956, p. 8.

[4] Wendell, M., Interstate compact for libraries. ALA Bulletin 58:134, February 1964.

In accordance with the Medical Library Assistance Act, the Board of Regents of the National Library of Medicine shall constitute and serve as the National Medical Libraries Assistance Advisory Board and shall thereby assist the Surgeon General in the policy matters and the grant applications engendered as a result of the establishment of regional medical libraries. This then establishes the National Library of Medicine as the central unit for the entire country. Many factors, however, must be determined before any satisfactory arrangements can be made as to the location and operation of the regional libraries, first and foremost among them being the establishment of the national network. In a report submitted to the National Science Foundation, the primary regions suggested for a proposed network are (1) Seattle, (2) Los Angeles, (3) Dallas, (4) Chicago, (5) Miami, (6) New York and Boston combined and (7) Washington, D.C.[5] [I should like to interject here, off the record, that any consideration of New York and Boston as one region would be sheer folly!] Another report suggests that a regional library serve a population of only 2,000.[6] Ideally a regional library should be only one day's round trip via surface transportation from any point within the region, but in order to establish a working national network within the next year or two, the traveling time may have to be somewhat greater. Depending on future population growth and the demands made on the regional center, it may be more economical to restrict the number of these centers and extend the transmittal functions rather than duplicate resources, equipment and personnel on a larger scale. Perhaps by the time the network is in full operation, helicopters and planes will be as commonplace as the automobile is today, thereby obviating the need for centers in closer proximity.

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[5] Warren, S. L. Proposal: The National Library of Science system and network for the published scientific literature. Wash., D.C., Office of the Special Assistant to the President for Mental Retardation, August 1964.

[6] Herner and Co. A recommended design for the United States Medical Library and Information System, 1966, Vol. 1, p. 15 (Unpublished).

Within each geographic region a "substation" should be established to assist the regional library in its services to the medical libraries. The substation would be particularly helpful where a region has two or more active medical centers/or cities. Where feasible the collections should complement each other, full cooperation between the units should be established and satisfactory arrangements should be made regarding the servicing of the two collections during peak use periods and during periods of binding and processing of segments of the individual collections. In order to support this second library, the regional library should subcontract for services provided either on an annual basis or on a "per item" basis.

The national medical regional library network should also comprise significant medical specialty collections such as those housed in the American Dental Association, the American Medical Association, the American Psychiatric Association, the Massachusetts College of Pharmacy, the John Crerar Library, the Linda Hall Library and the New York Academy of Medicine. Smaller, but equally important collections devoted to narrower medical specialties such as aerospace medicine and cardiovascular diseases should also form a link in the network and receive support for their services to the nation's biomedical community. Support for these collections could be obtained from subcontracts negotiated by the appropriate regional library or from contracts negotiated directly by the National Library of Medicine in accordance with sections 397 and/or 398 of the Medical Library Assistance Act. These specialty collections are strategic for any plan to make the total medical literature available for all to use and further effort should be made to identify them within each region. Such collections so supported, of course, would be made available to the entire country, not just to its particular region.

Regional library systems already in operation within the medical library region should be investigated for possibilities of collaboration and/or modification of existing contracts. Where regional union catalogs are being supported, the feasibility of participating in the operation should be considered, especially since the estimated cost of maintaining a separate union catalog ranges from $20,000 to $30,000 per year.

The administrative office of the medical regional center collection and service department should be a unit separated from the regional library but responsible to the director of the regional library.

Perhaps we could look at Figure 1 for a minute and I will explain more of the administrative organization depicted there. This is just a suggestion for a regional medical network; namely, one in which you have the National Library of Medicine as the country's head of the network, providing supplementary services to the regional medical libraries.

Utilizing the regional library services would be the existing health science libraries, individual physicians, students and scientists, particularly those which are not affiliated with a medical library. The latter could also be served through collaboration with an existing regional library system.

To provide supporting services, substations could be established and contractual agreements could be made with national medical specialty collections. Additional peripheral library materials could be obtained by the National Library of Medicine from national resource libraries such as the Library of Congress and the U.S. Department of Agriculture Library. Naturally there would be several other crossties which you cannot show on the chart, but hopefully, most of the service would be channeled through the regional medical library and through the individual libraries in the system.

In order to service its primary clientele properly, the existing regional library staff should be relieved of any major responsibilities for servicing the other libraries in the area. If the director of the regional library is able to absorb the additional duties of regional center director, this organizational pattern would probably result in the greatest efficiency and in the smoothest operation of the system. If this is not feasible, then perhaps an administrative assistant should be engaged for the purpose of overseeing the regional center operation. A similar system already functioning is that of the Medical Library at the University of Wisconsin.[7]

One of the major factors to be considered in determining the extent of a medical library region is the size of the clientele to be served by the

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[7] Crawford, H., Regional plans for medical library service: proposal for an expanded medical library extension service for Wisconsin. Bulletin of the Medical Library Association, 52:514-520, July 1964.

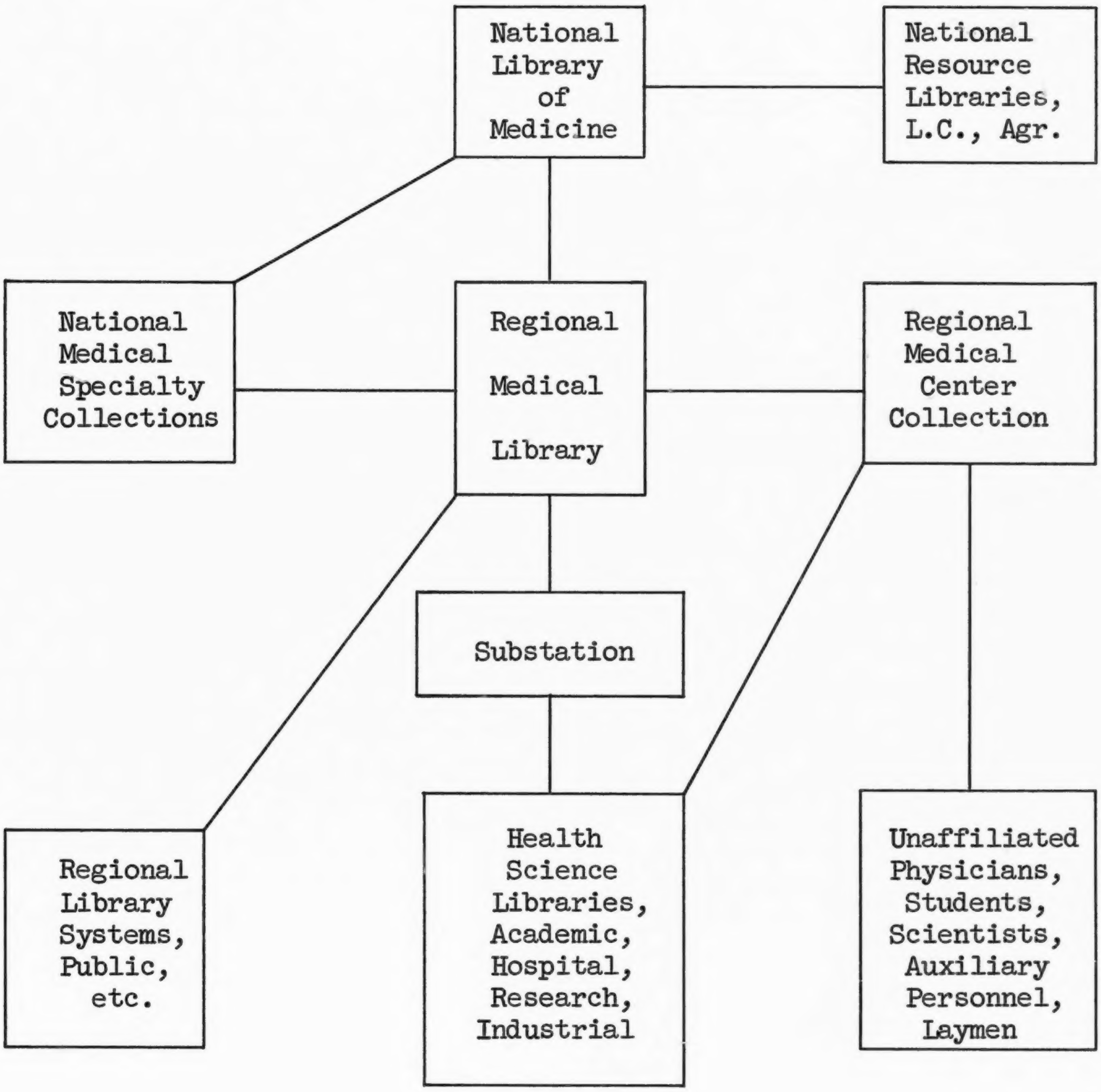
National Library of Medicine
National Resource Libraries, L.C., Agr.
National Medical Specialty Collections
Regional Medical Library
Regional Medical Center Collection
Substation
Regional Library Systems, Public, etc.
Health Science Libraries, Academic, Hospital, Research, Industrial
Unaffiliated Physicians, Students, Scientists, Auxiliary Personnel, Laymen

Fig. 1 Regional Medical Library Network Organization.

regional library. Hopefully the medical populations will be equalized among the various regions, if not at first, at least eventually through the establishment of additional regional centers. Once a region has been defined, however, the first facts to be determined are the exact quantity of the region's medical clientele and the extent of service which can reasonably be extended to this clientele.

A typical medical region will undoubtedly have one or more schools in the health sciences, namely medicine, dentistry, pharmacy, public health, osteopathy, veterinary medicine, nursing and other auxiliary medical sciences. The student enrollment and faculty figures are normally available from the school catalogues, etc., and data on the various libraries serving these schools and the extent of the services provided by the libraries should be obtained either through personal contact or through the survey data recently collected by the Medical Library Association's Committee on Surveys and Statistics and by the Association of American Medical Colleges. Information on the interlibrary loan activity of these libraries may provide estimates on the projected use of the regional library by the academic medical community. Not all loan activity of course will be transferred to the regional library, since it will always be faster and more economical to borrow an item from a larger library across the street than to wait 1-3 days for the loan to come from the regional library. The continuation of a great quantity of this particular lending and borrowing pattern may necessitate further subcontracts by the regional library in order to relieve the burden of interlibrary loans for the "neighborhood" library. The largest source of medical personnel to be served within a region will be that employed by the hospitals--private, city, state and Veteran's Administration hospitals--basic data on which can be obtained annually in the guide issue of Hospitals. Most hospitals will have a medical library--some well supported and staffed and some grossly inadequate. Each regional library must determine the amount of supporting services which can be offered the substandard hospital library versus the amount of advisory assistance which should be given to raise the library to suggested minimum standards.[8] Here again is where the "substation" library can be of great

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[8] Joint Committee on Standards for Hospital Libraries. Hospital libraries: objectives and standards. Chicago, American Hospital Association, 1953.

assistance, for many of the requests from a hospital library are for retrospective volumes of commonly held book and journal titles and servicing of these titles could be divided between the libraries if the quantity of requests becomes prohibitive. Another source of medical personnel will be the component and constituent societies of the American Dental Association and American Medical Association as well as the independent medical societies, some of which will have libraries servicing their respective members. Current data on these libraries may be obtained from the survey of medical society libraries being conducted by the Medical Library Association's Committee on Surveys and Statistics in cooperation with the American Medical Association. Only a relatively small percentage of the members of these societies should be considered as "additional clientele to be served," since most members will be affiliated with some medical institution in the region. Within each region research institutes conducting medical research will constitute another segment of possible borrowers. Most of these institutes, whether supported by federal, city or state government, academic institutions, private enterprise or industry will have highly specialized libraries and will require the loan of many common medical items which do not fall with the scope of their particular specialty. Summary data on these libraries may be found in the Directory of Special Libraries and Information Centers compiled by Dr. Kruzas.[9]

Demands made upon the regional library by the industrial medical libraries in the region should perhaps be subject to a quota of free services. If the industrial library houses a specialized collection which it is willing to make available to outside borrowers, a contractual agreement should be drawn up between this library and the regional library for the cooperative servicing of the collection.

A large body of clientele to be served, and undoubtedly one of the most important segments, is that of the private practitioners who are not affiliated with any medical institution housing a library. Direct service to these physicians and to auxiliary personnel should be provided by the regional center staff. Whenever possible mail and telephone requests should be filled promptly and the resources and facilities of the regional library and center collections should be available for study and for use by these people at any time upon presentation of proper credentials.

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[9] Kruzas, A. T., ed. Directory of special libraries and information centers. 1st ed. Detroit, Gale Research Co., c1963.

One final segment of users which is not to be overlooked is that of elementary and high school students and laymen desiring access to a broad spectrum of medical knowledge. The science fair movement is probably well known to all of you and well defined policies regarding service to these students should be drawn up for each region. With the proper encouragement, the student may well become part of the medical task force in the near future. In serving the public, close cooperation with the local public libraries is needed to provide the proper class of literature to be digested. Once the clientele to be served in the region has been fairly well defined, the next task is to determine the type and extent of library services to be offered. For the purposes of our discussion, let us define library service as encompassing the maintenance of an adequate, up-to-date collection for the users, the accessibility of all materials in the collection through direct selection from open shelves or through prompt delivery, the loan of materials for a reasonable length of time, assistance and instruction in the use of the collection, the maintenance of hours of service to fill the needs of the users and the provision of services such as translating, compilation of bibliographies, interlibrary loans and fact finding.[10]

Of immediate concern to the regional center's staff will be the circulation of library materials to individuals, institutions and other libraries, and as specified by the Medical Library Assistance Act this service is to be extended free of charge. In order to adequately serve a clientele which is only partially known, the circulation system must be adaptable to the varying demands made upon it, such as loans to individuals, interlibrary loans and immediate recall of needed items. As far as possible circulation procedures and regulations should be uniform throughout the region, allowing easy access to medical collections by qualified members of the medical community. Perhaps a variation of the Newark charging system could be adapted whereby both individuals and participating libraries could be issued library borrowing cards which might be used in any medical library in the region.

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[10] Association of College and Research Libraries. Statement of service to library users. ACRL News no. 2:21-22, April 1966.

As I have mentioned previously, mail requests for the loan of library materials from individuals should be filled on a regular basis, particularly in cases where the person does not have an adequate medical library in his vicinity. Abuse of this service should be handled on an individual basis.

The quantity of loans which may be expected by a regional center will vary considerably from region to region, depending upon the adequacy and quantity of existing medical libraries and the proficiency of the staff servicing these libraries. The percentage of individuals requesting direct loans might be roughly estimated as ranging from 15-25 per cent at first. As the services become better known, this percentage will probably rise.

Interlibrary loans, of course, are a problem all by themselves and since this topic is being extensively reviewed by Miss Annan at this Conference, I should like to outline this service only briefly. Wherever possible the regional center library should absorb the majority of the interlibrary loan activity within the region and provide free photocopies of pertinent materials even though the Act does not actually specify the latter as a free service to be provided. Requests for loans should be made on a multi-part form, either the ALA interlibrary loan request form or a local adaptation of the same. The handling procedures should be the same as those currently in use, but the restrictions on materials to be lent should be almost completely abolished, with the possible exception of very rare and/or valuable items.

Requests for items not held by the regional library could be forwarded directly to other regional or special libraries or the National Library of Medicine by the regional library staff, who in turn would notify the requesting library of its action. Or the requesting library could handle its own referrals once a clearance slip was received from the regional library, indicating other possible locations for the particular item.

The quantity of interlibrary loan services again will vary from region to region and probably the quantity will increase substantially once the regional library assumes the responsibility for and acquires the adequacy to fill 90-95 per cent of the loans now being forwarded to the National Library of Medicine.

Based on available data,[11,12] most larger medical school libraries lend only 2-10 per cent of their total circulation as interlibrary loans, but once major lending restrictions are removed, this will undoubtedly grow by leaps and bounds. Additional data on the region's interlibrary loan activity could perhaps be obtained from local library annual reports, local surveys, state statistics, etc.

Extensive reference services to individuals, institutions and libraries should be offered by the staff of the regional library as well as the staff of the regional center collection and should comprise the following activities. (1) Selective bibliographies should be compiled on any health related subject utilizing available medical indexes. Requests which can be filled by the use of Index Medicus should be referred to the local MEDLARS center. (2) Translations of short articles should be undertaken where no previous translation exists. A direct communication wire (either telephone or teletype) with the SLA Translations Center would be a useful adjunct to this program. (3) Fact finding, or what is commonly referred to as "ready reference" should form part of the daily routine of the regional center staff and should be freely available by phone, by letter and by personal contact. (4) Reader guidance can be offered on a limited basis, since this would be better done by the local units where the user's needs can be more fully explored. The quantity of reference services offered will again vary considerably from region to region, depending upon the quality of local collections and the training and education of the local medical librarians. Much needs to be done, however, in providing reference service to the non-affiliated physician.

Since the MEDLARS services are also being discussed quite extensively this morning, I should like merely to outline the services which can be extended to the region. Where feasible a MEDLARS center should be located in or near the regional library center in order to adequately serve the growing needs of medical personnel for up-to-date information on all aspects of medicine. The use of MEDLARS tapes to fill requests for bibliographies in the

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[11] Keenan, E. L., Medical school library statistics. Bulletin of the Medical Library Association, 52:386-409, April 1964.

[12] Wagman, F. H., Planning complete national reference and research service, Canadian Library, 20:253-257, March 1964.

health science field, particularly where a large body of material must be searched, will probably be increased considerably in the near future, despite the need for objective data on the efficacy and economics of machine search versus hand search methods. A great deal of hand searching will have to continue, nevertheless, since the major portion of the past medical literature appears in printed book catalogs and indexes and is not available in machine readable form. The "current-awareness" functions of the MEDLARS system may become an extremely valuable tool, particularly for research personnel. Coupled with the ability to provide abstracts for the citations uncovered during a machine search, the computer will be providing a great contribution to the individual's needs.

In order to meet the needs of the region as well as individual users, careful consideration should be given to the hours of service offered by the regional center. Ideally library facilities should be available to physicians at all times, with emergency service being provided whenever the need arises. As a starter it is suggested that reference, circulation and photocopying services be available Monday through Saturday 12-14 hours per day and on Sunday for 3-5 hours. If the usage does not warrant these extended hours, the service could be curtailed to meet the actual demand. At least one professional librarian should be on duty at all times to fill the patron's requests.

Another important function of the regional center is that of providing consultation, training and field services. Initially the staff should contact each medical library in the region to explain the services being offered by the regional library and enlist their cooperation and active participation. The staff should be available at all times to assist local libraries in the development and improvement of their programs and to provide training programs for these librarians. Those libraries which are inadequate to serve their own clientele, should be encouraged to conform to established standards or to suggested guidelines.

In order to make its current resources known, the regional library should distribute information on its current acquisitions either by means of a printed list generated from a data processing program or by means of cataloguing slips or cards which may be incorporated in local catalogs. Cooperative agreements regarding current resources should be made with existing specialized libraries in the region, thereby making available to all concerned data on 90-95 per cent of all new publications in the health sciences. A necessary adjunct to these services is the compilation and distribution of the list of serial holdings of the regional library, similar to that produced by the John Crerar Library.[13] Where other libraries in the region are cooperating with the central library to provide wider coverage and access to serials in the health sciences, a composite list should be compiled. Careful consideration should be given to the actual need for a union list of serials in the region before such a project is undertaken, and the decision to compile one should be based on a demonstrated high frequency usage. The alternatives of telephone and teletype service should be investigated as to comparable effectiveness, economy and ease of access.

Once the services to be offered by the regional library have been determined, immediate steps should be taken to implement these services by the assignment and/or employment of sufficient professionally trained librarians and clerical assistants. The number of personnel needed to carry out the regional program will vary, but all staff utilized should be of the highest caliber in order to set the standard for other libraries to follow and in order to provide the necessary training and consultation services. If a moderately heavy demand is made upon the regional center, the following staff requirements might be considered as an adjunct to the staff of the regional library itself. As I mentioned before, the director of the regional medical library system ideally should be the director of the medical library in which the regional center is housed. If said director is unable to devote at least half of his time to the regional operation, an administrative assistant should be employed to act as general overseer and coordinator. A full-time secretary to the director should be added to the staff in order to handle the administrative correspondence.

Since the heaviest usage made of the regional center at its inception will be the loan of library materials to other libraries and to individuals, one professional librarian and two clerical assistants should be considered to service the collection and provide the necessary photoduplication services. In order to extend reference service to the region, two reference librarians who would be on duty alternately during the hours of service, should be added to the staff, particularly when the work load of the regional library is already of a relatively high magnitude. Additional personnel will also be needed for the technical processing of the regional center's collection, especially when the regional library collection needs to be augmented to fulfill its purpose as a 90 per cent library. Depending upon the need for expansion of its resources, the regional center should consider adding two professional and two clerical assistants to accomplish this expansion. If a computer center utilizing Medlars tapes is adjacent to the center, two to four information specialists may be needed to fill requests for demand bibliographies and to produce current book catalogs. Finally, at least one professional librarian should be enlisted as a field representative and public relations person. If the geographic area is of such dimensions that no more than one or two visits per year to each medical library in the region is possible, an additional field representative should also be contemplated.

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[13] John Crerar Library, The John Crerar Library list of current serials, 5th ed. Chicago, 1965.

Concurrent with the expansion in services to the region, should be an expansion in resources of the regional library. As I have mentioned before, the regional library ideally should be capable of filling 90-95 per cent of the demands made upon it, either through its own resources or through contractual agreements with nearby specialized collections. To do this the core collection should include basic clinical and research materials in all health fields, both currently and retrospectively. Wherever possible, gaps in coverage should be filled without delay and the possibilities of transferring and combining older, less used material from other libraries in the region should be investigated. This might be done on a reimbursement or on a retention of ownership agreement. In addition to books and journals in the health sciences, core materials in the basic sciences, particularly chemistry, are of an absolute necessity unless a nearby science library agrees to provide unrestricted loans of its collection.

It hardly seems necessary to say that every effort should be made to coordinate the acquisition of expensive, rare and specialized library materials. On a current basis these should be treated as additions to the regional library, but on a retrospective basis an attempt should be made to locate existing copies within the region before any decision is made to acquire.

The core collection should also be carefully evaluated as to an adequate number of duplicate copies of heavily used books. This should also apply to a collection of reserve books which may be maintained by the regional library to serve its primary clientele. The other factor to be considered is the general condition of the collection. Is the major portion of the collection in good repair? Are substantial pamphlets put in Gaylord binders? If not, a rebinding program should be undertaken.

The reference collection of the regional library should be as complete as possible, including nearly all the monographic works listed in the Handbook of Medical Library Practice[14] as well as complete sets of the major indexing and abstracting tools in the health sciences and in the basic sciences. Duplicate copies of heavily used directories and encyclopedias should be purchased for the use of the regional center staff and duplicate copies of selected reference items such as the Merck manual, Accepted dental remedies and Modern drug encyclopedia should be available for loan to individuals and institutions.

The basic serial collection should also be adequate to fill 90-95 per cent of the demands made upon it and current subscriptions should be in the range of 2,500 to 3,000 titles. Nationwide agreements need to be made on providing 100 per cent coverage, with each region being responsible for a segment of the foreign titles and for complete coverage of locally published titles. Where back files are incomplete, every effort should be made to fill these in, perhaps with microfilm copies, since the usage will not be heavy enough to warrant the expense of maintaining complete files in the original. Another alternative to consider is a service agreement with a nearby depository library that may have the material on file.

In order to provide proper service to the region, it may be necessary to acquire duplicate copies (unbound issues) of a basic list of serial titles covering a five year span. These would be available for loan primarily to physicians in the region and would be utilized for the photocopy service as well.

Considering all the components of the regional library collection, it may be advisable to have 250,000 to 300,000 volumes and to keep the percentage of duplicate material within approximately 15 per cent of the entire collection. To maintain the collection, approximately 10,000-12,000 volumes per year should be added and subscriptions to all new serials and indexes of major significance should be placed.

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[14] Medical Library Association, Handbook of medical library practice. 2nd ed. Chicago, American Library Association, 1956.

The additional equipment needed to service and process the regional library's collection will depend largely on the extent of service to be offered, the geographic area to be covered, the extent to which automatic data processing is undertaken and the amount of existing equipment available for use. It seems reasonable to expect that the following list would be the minimum amount of equipment needed to run an efficient operation.

(a) 2 Xerox 914 copiers and 1 Xerox 813 copier

(b) 2-3 microfilm reader/printout devices

(c) 1 microcard reader

(d) audiovisual equipment including at least one each of a tape recorder, a slide projector and a film projector

(e) data processing equipment such as a keypunch, a sorter and a computer

(f) library center equipment and furniture such as serial record equipment, card catalogs, office furniture, book stacks, etc.

A large item to be considered is the equipment needed for a rapid communications system. Obviously additional telephone lines will be needed and the feasibility of direct lines between the substation and other heavy borrowers should be investigated. One or two teletype machines should be installed providing hook-ups not only with the regional libraries, but also with the other regional medical libraries, the National Library of Medicine and such centers as the John Crerar Library and Linda Hall Library. The applicability of closed-circuit TV and facsimile transmission should also be explored, but the cost of these services at the present time may be prohibitive.

Now that we have outlined the needs of the regional library for staff, resources and equipment, a facility to house the operation must be constructed. If the regional library building is relatively new and is more than adequate to house and serve its primary clientele, space within this building could be allocated to house the center's staff, duplicate journal collection and communications center. Where the present library is nearly filled to capacity, a grant application should perhaps be submitted to build an annex or an adjacent building for the regional center. The amount of space to be provided should be determined on the basis of 75-100 square feet per person for office space and 10-11 volumes per square foot of floor area for the housing of the collection.[15]

Based on the proposals contained in this report, the following estimated budget might be envisioned.

I.	Staff		
	Director (1/2 time)	$ 8,000	$ 8,000
	Professional		69,000
	5 @ $8,000 ea. (Ref., Circ., Cat.)	40,000	
	2 @ $10,000 ea. (Computer Ctr.)	20,000	
	1 @ $9,000 (Field Serv.)	9,000	
	Clerical		18,000
	4 @ $4,500 ea.	18,000	
II.	Resources		115,000
	10,000 vols./year @ $10.00/vol.	100,000	
	Binding	15,000	
III.	Equipment and Supplies		
	Office furniture		4,200
	12 desks @ $275 ea.	3,300	
	12 chairs @ $75 ea.	900	
	Supplies	8,000	8,000
	Typewriters, 6 @ $200 ea.	1,200	1,200
	Medlars Center operation	85,000	85,000
	Photocopy equip. rentals	720	720
IV.	Construction		248,000
	5,000 sq. ft. stack area @ $40/sq.ft.	200,000	
	1,200 sq. ft. office area @ $40/sq.ft.	48,000	
V.	Other		18,000
	Postage	5,000	
	Travel	8,000	
	Communications	5,000	
VI.	Grand total		$ 575,120

Fig. 2 Estimated Budget for Regional Medical Library Service

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[15] *Ibid.*, p. 61.

In addition to the monies granted by authorization of the medical Library Assistance Act, a regional medical library might explore the possibilities of obtaining additional financial support from foundations such as the Rockefeller Brothers Fund, from local medical societies, particularly those which do not support a library and from local philanthropic interests. Individuals conducting medical research projects under the auspices of a grant program might be amenable to contributing to the support of the regional medical library if sufficient library services were provided. Efforts should also be made to obtain local gifts of money and/or materials to enrich the collection. Local physicians possessing private medical collections should likewise be contacted as to the possibility of future purchase or donation of the collection.

When planning for the regional medical library of the future, we should keep in mind that the present proposals are merely temporary measures which do not solve the ultimate problem of making available the ever-burgeoning explosion of medical knowledge. One of the crying needs of the library profession today is basic research in library science. Can the needs of the future be met by hypotheses such as those of John G. Kemeny in his "A library for 2000 A.D.?"[16] Will syntheses or simple miniaturization provide the key or should we be devising entirely new approaches to the initial recording of knowledge? These and other questions should be fathomed as we search for answers to today's need for biomedical information.

Let us now take a look at some of the budgetary items which we might consider. In some cases these are wild guesses and in some cases this may not represent what a regional library or regional system will need. It will vary considerably from one area to another but this is, in outline, what I have suggested to operate a regional center. Perhaps, too, I should clarify that I am thinking in terms of a regional center collection which will be in addition to the regional library.

For instance, if you are planning on having a regional medical library established at an academic institution, I think it may be a much smoother operating system if you have an entirely separate staff and an entirely separate service department from that of the school. I think your services, if they are merely an expansion of the school library, are going to become too complicated, too enmeshed; you are going to get them too confused as far as what service you are going to offer to the student and what service you are going to offer to John Q. Public or to the physician walking in off the street wanting some assistance. Needless to say, you can't have your regional center collection duplicate your regional medical library; but at least you can have, on a current basis, duplicate material to service your regional clientele.

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[16] Kemeny, J. G., A library for 2000 A.D. In: Greenberger, M., ed., Management and the computer of the future, p. 133-162. Cambridge, Mass., M.I.T. Press, 1962.

I have suggested that you have a part-time director. I am estimating he would be receiving in the range of $16,000 a year. Perhaps half of his time would be devoted to it, as is indicated by the $8,000 figure.

As far as the professional librarians are concerned, I am thinking in terms of five; namely, one for circulation, two for reference, and two for cataloging, estimating their salaries at approximately $8,000 each. This again is low for some areas, high for others.

If the computer center is to be located either in or right near the regional library, we should perhaps consider at least two programmers, and we should probably think in terms of $10,000 each for these people. I am also considering one person for field services, public relations, publicity and so on. As I mentioned in the paper, you may have to consider two people, depending upon the extent of the region and the extent of service you plan to give in this area.

Approximately four clerical staff may also be needed and again this might not be adequate. Estimating their annual salaries at $4500 each for a total of $18,000, this will bring the total salary budget to roughly $95,000.

Let us look at the budget for resources. In order to augment the regional library collection to the common 90 to 95 per cent core library that should be considered for your regional clientele it may be necessary to expand the resources considerably. However, if the library being designated as a regional center already has a collection of 150,000 to 180,000 volumes, a great amount of expansion may not be necessary, depending upon the quality of the collection. For an annual expansion of resources during the five-year period, you should probably consider a minimum growth of 10,000 volumes in addition to the volumes being added to the primary library.

To arrive at the cost for augmenting the library collection. I am estimating the unit cost as $10 a volume. I checked some of the statistics that MLA has already collected, and despite published data at $12 a volume, I cannot find support for this figure. I am not aware of an academic library which has published data indicating expenditures of more than eight to nine dollars a volume on an average. The unit cost may be low, but I am using the NLM estimate of $13 a volume for journals and coupling it with the $8 that you now find published, to arrive at the estimate of $10 a volume.

Binding costs depend upon the extent of binding that needs to be done, but I should estimate maybe $15,000 a year. This will give you approximately $115,000 to consider for resources on an annual basis.

I arrived at a figure of $4200 for equipment by estimating the cost of 12 desks at $275 apiece and 12 chairs at $75 apiece.

The figure for supplies is a very rough estimate but perhaps it wouldn't be too far off to suggest $8,000.

For the MEDLARS center operation I am estimating $65,000. I am including here two staff members at $10,000 a year, so that perhaps an operation of MEDLARS may be in the range of $85,000. I am basing this on figures submitted both by Harvard and by Alabama for the installation and operation of a MEDLARS center at their respective institutions.

For construction I am estimating approximately 5,000 square feet of stack area, and quoting at $40 a square foot, this would come to approximately $200,000. I am also estimating nearly 1200 square feet of office area at approximately $40 a square foot, and this will bring it up to about $48,000, which would be just a rough total of $248,000.

Another item to consider is postage. Now I don't know how good a postal service you have in the Pacific Northwest. I've been a little flabbergasted with what a horrible one Chicago has. I thought New York and Boston were bad, but I don't think any area can beat Chicago. Sometimes it takes six days for a first class letter to travel 12 blocks.

As far as our members are concerned, on some items we've had a waiting list of six and eight months. We finally cut this down to two to three months by using first class postage and air mail postage--and you can imageine what this cost. Certainly you should investigate the postal services within the region, and consider perhaps some first class and air mail and United Parcel service where it is needed.

I am just giving a wild estimate of perhaps $5,000 to consider for postage. For travel for the field service representative, and for some of the other members of the staff perhaps, I am estimating about $8,000.

I have at present no accurate figures on operating a Teletype system, but I believe that $60 a month for the installation and terminal and a rate depending on use and distance is correct. This service should be investigated. You may feel that the region does not require it. Perhaps you have a region which is going to be primarily half a state or one or two cities, depending upon the population, so Teletype shouldn't even be considered; but if you are going to have an area that is sparsely settled, perhaps you should consider this in some of your major cities in order to cut down your telephone calls. Perhaps an individual physician could call a library not more than 50 to 60 miles away, or a hundred miles, and then that library could utilize Teletype facilities to receive the information.

At this time I would like to lay open some of the questions to you people in areas you would like to discuss.

Discussion

Q: I had understood that Society libraries would be considered as subsidiary installations. And I had understood also that they were practically going out of style; that the members are complaining about costs--and are talking of closing their libraries.

MISS KEENAN: The Society library network, particularly those which are constituent societies of A.D.A. or A.M.A., and so forth, are very, very few and quite worthwhile; and I think each region should definitely consider contacting them about the feasibility of combining them. I understand that NLM includes in the regional library proposals a provision which would make money available for combining these libraries: the cost of combining collections, servicing them, and so on.

Q: You mentioned circulation of materials. We've been circulating as much as possible sending out copies rather than the material itself; but you send out material, don't you? At least I've received many journals from you.

MISS KEENAN: We try and estimate the cost involved, and we do maintain a lot of duplicate unbound copies which frequently we will send out, particularly if they include illustrations which will not reproduce well on Xerox.

However I should ask Dr. Cummings to comment on the photocopying services to be provided. Does NLM really envision that these regional center libraries provide free photocopies?

DR. CUMMINGS: Yes.

MISS KEENAN: The way the Act seems to read this is not specified, and I personally feel that the whole system is going to break down if this is not provided.

DR. CUMMINGS: For those regional libraries that we support, there will be contractual understanding that photocopy services will be free.

MISS KEENAN: Without this you are going to have a considerable drawback, as far as an individual requesting material is concerned. I know even myself, in trying to get material to do some of the reading for this paper, I have tried to get materials in library sciences and had to pay 30 cents a page which is a little expensive. Even a physician, who may be earning $15,000 or $20,000 or more a year, will find it pretty high to start considering 30 and 50 cents a page for the materials he needs to read.

Q: Another thing that slightly appalled me was serving high school students.

MISS KEENAN: I was wondering how many other systems are providing such service.

Q: All those that come to us may use the material in our library.

Q: But you don't loan them anything to take outside?

Q: No.

Q: That is also our present arrangement. Actually, we don't feel that we are doing a very good job for them. We would like to help them, and we fill a lot of mail requests with photocopies without charge. We get letters from all over the country, and sometimes we recommend they go to a library closer to home.

Q: We do encourage students who are considering engaging in some medical career; or if they are attached to some faculty member who may employ them in some center for a summer job.

MISS KEENAN: This perhaps is an area in which the local school systems within the state should be investigated. Can the regional library afford to provide services to them, can they have just a limited amount of general material available, or should their cooperation be with the local public library and just provide technical material where it's really needed for these students?

Q: This is just trying to help the individual student, but many times a teacher will assign something to an entire class, and you get a whole flood of letters: "Send me everything you have on cancer." I think we should start with the teachers who should be told what sort of service is available and what isn't.

MISS KEENAN: This is, perhaps, where your field representative can come in. Where you have once set up a regional system and you have definite policies set down, then your field representative should contact some of the local school systems and suggest areas in which you can cooperate and also areas in which you feel you should not cooperate.

Q: I would like to go back to the Society library question. I am on a committee that is again opening talks about establishing some contractual relationship between the King County Medical Society Library and the Health Sciences Library. I understand that the A.M.A. had done a study of Society libraries?

MISS KEENAN: Yes.

Q. And there hasn't been a full report issued on that?

MISS KEENAN: No, but it will be published.

Q: I understand there have been $2,500,000 set aside to establish regional libraries, but can the regional libraries depend on Congress for continued support? Is this the conception of the people who are planning the regional libraries?

DR. CUMMINGS: I want to distinguish between regional medical libraries that we support and others that may emerge in some other basis. For those that we support, our intention is to make five-year commitments, and if the regional library services are effective, we will continue to make further five-year commitments for support. However, if a regional library is not effective it will not be sustained.

Let me reiterate, our agreement to provide support for the establishment of a regional library is not to be construed as a guarantee that the support will continue. It will go on so long as the regional library continues to serve a useful purpose.

I would like to comment on something that came up, in part, a few minutes ago: I must say that I was appalled to find the words "layman" and "public," in your scheme here.

I would like to make it quite clear that NLM funds will be provided for regional library services to personnel engaged in the health sciences. We have no intention of providing services to the general public. I want to be certain that people who may have an interest in the regional concept of library services know that NLM will support services to users who are qualified to have access to medical materials, and this does not include the lay public.

MISS KEENAN: I think what I'm referring to here is that exact policies as to whom you are going to serve have to be laid down. You are always going to be faced with a situation of a man walking in off the street, and he is simply going to have to turn around and walk out.

Now perhaps this can be absorbed, on a very, very limited basis, by the primary library's budget. This is where contracts or cooperative agreements with the local regional system or with the local public library system should come into play, and these people should be referred to these libraries and not be served by the national network of regional medical libraries.

Q: As regards field representatives, I was wondering whether Bill had any comment--because I guess you are your own field representative--and the effect this has on the smaller libraries that depend upon your services in British Columbia.

MR. FRASER: I think this is a very vital aspect of regional service. This may be one of our real key people: the field representative. I find that it has a tremendous effect to visit small hospitals, to encourage them to use this service. Up in B.C. this is an active, growing activity.

MISS KEENAN: Do you find this does encourage these libraries to raise the standards of their selection policies?

MR. FRASER. No question about it.

MISS KEENAN: It seems to me it definitely should. I was just wondering how it has worked out.

Q: What is a typical library that you visit?

MR. FRASER: It's a tremendous range, from Victoria, B.C., which has a large hospital library to two or three places which have doctor libraries, such as places like Golden, which is a small town.

MISS KEENAN: I would like to raise one point to get your views: Proposals have been made to establish a depository library within each region. I just wanted to find out how some of you felt about the practicality of such a proposal.

Q: In what sense?

MISS KEENAN: Well, perhaps something on the idea of the central research libraries, such as in the Midwest or perhaps what Eric Meyerhoff has in New York City.

Q: This would be of little-used material?

MISS KEENAN: Yes, on a joint ownership basis or a retention of ownership basis.

Q: Presumably this would be a collection on a central basis and material that comes from a variety of sources. Wouldn't this depend somewhat on the region? In New York I suppose it's very natural, but where you have large libraries which may be faced with storage problems, would this be what some of your people would think of?

Let's take the region here, for instance, which is large. Would there be much gain by having small libraries? How often would their material be deposited?

MISS KEENAN: Well, you will find opinion across the country very sharply divided. Some people feel this is an absolute necessity; others feel that it's just a waste of time.

Q: Well, do you feel their answer depends on the environment in which they find themselves?

MISS KEENAN: I think this may be true to a certain extent, but I would hesitate to impose this on a nation-wide basis. This would be a substantial component of the network.

Q: What is the possibility in the United States of obtaining anything major from foreign countries which may be copyrighted, e.g., from England, Cambridge, the British Museum? Has this ever been explored in the United States, or would this possibly be an avenue of exploration for the medical library system?

Suppose there would only be ten or so, or maybe twelve copies needed for copyright, one going to each regional library, thereby helping with the acquisition of materials.

MISS KEENAN: Well, you don't want to duplicate your resources on too extensive a basis.

Q: No, but there aren't going to be very many regions. Didn't you mention twelve?

MISS KEENAN: Well, this was the proposal that was submitted. I am not sure whether this is exactly how many NLM has in mind. I think perhaps ten or fifteen and expanding to more than that.

However, efforts should be made to acquire more than one copy of the materials in the health sciences for availability in this country and that we not just rely upon NLM for that one and only copy.

Q: Well, they could give you fifteen or so.

MISS KEENAN: Perhaps we wouldn't need it on quite that extensive a basis.

Q: In acquisition of resources, depending upon the kind of service you want to provide, do you envisage a greater use of microform, something that could be reproduced outside by use of copy expansion rather than full size?

MISS KEENAN: I think this should definitely be investigated, particularly if you are going to be filling in back sets of periodicals, where usage is not going to be very high. I think more consideration of this should be given even to current materials, provided you give real service with this. I think most library users refuse to accept microfilm but I think this is because most librarians don't want it; this is often because they are not willing to go get the microform, put it on a machine, and provide the user with a copy right there.

However, if you are able to provide this service, I don't think there would be that much opposition to it.

Q: For the separate operations which you mentioned earlier, e.g., a medical school library and an attached regional library serving the region--which would be mostly by means of mail--could the acquisitions then be in microform so the circulating or the full size copy could be made available to the local staff attached to this same institution?

There is a conflict developing, apparent in our library, too: a conflict between demands that are made on us from outside and from within the building. It's not always clearly drawn, but there is insistence that material be available there for the clinical faculty, for instance, and for students, and the demands of having this material available for outside use.

MISS KEENAN: In any program like this, one must investigate first of all, the costs involved in providing microform editions versus costs in working with duplicate unbound issues. You might also investigate the cost within the regional library itself, of serving its primary clientele, by an adequate number of sets needed of any particular material versus duplicated or Xeroxed copies.

Q: In this area I know we can't send interlibrary editions out on film because it would be going to someplace without reading facilities.

MISS KEENAN: I think in view of some of the remarks made by Dr. Kroll this morning, we should also keep in mind the region to be considered and not just automatically consider that it's going to include five whole states or two whole states or something like this, and give consideration to topographical geography in determining a region.

In some cases, you are also going to have to create a need for service. You are going to have physicians in the area who now get along very well without ever reading a journal. Then on the other hand you are going to have a certain amount of repeats. We have some people who send for a little every single week.

Q: That is true of our graduates. They don't like to cut the silver cord, and they write in from various places.

Q: I think with the developing emphasis on continuing education in medicine, this will change because there will be more and more demands from physicians who have contacted us in the past. I know it has happened.

Now these factors are important, I think, in our establishment because, as you find you have an active continuing education program, the needs of the library will change from region to region.

Q: I think you will soon find that your two reference librarians are quickly swamped.

MISS KEENAN: Yes, but a lot of this depends upon how much regional service the primary library is already giving and how much of this can be transferred. Some of the reference librarians will be able to give more service to your primary clientele and still will be able to absorb some of this regional service.

Q: That brings me to another question: where are the people going to come from?

Q: From what I've seen the output of professional librarians is not coming from the larger library schools; it is not, in any significant way, changing from what it was, let's say, ten years ago; and if the demand is there, these librarians have to be found somewhere.

Q: Well, I wonder, if we get these people, whether they wouldn't come from outside the library schools.

Q: Where is the initiative in organizing regional libraries to come from? Is that to come from the National Library of Medicine, or would that depend on regional demand? It depends upon funding right now, doesn't it?

DR. CUMMINGS: We are interested in learning from you, as I am learning today at this meeting, your concepts of regional user needs. We are particularly interested in your views regarding national library service patterns.

Ultimately the determination of where the Federal support will go is the responsibility of NLM and its Board of Regents. This support will go to those institutions who have thought their way through the regionalization concept and who can provide a good working plan. These institutions will have to work under standards and guidelines to ensure uniformity of operation among regional libraries. This is why I was interested in some of the questions you raised--although I must admit I was disappointed somewhat in the answers. For example, do you need repositories or warehouses linked to regional libraries? We have our own prejudice against this. I think that is a return to the 19th century concept of a library.

I am disappointed also that the concepts thus far don't envision anything beyond traditional photocopy service. I am hopeful that before the conference ends there will be some discussion about other mechanisms to be used for disseminating published medical information.

One thing I think I should say that might be helpful--and I'm prepared to be shot down on this: I think it wrong to plan a regional medical library out of the context of local library resources. The NLM intends to upgrade local medical libraries as part of the national effort.

Therefore I would have reservations, for example, about a proposal that called for a regional medical library with a seating capacity for 400 readers, et cetera, which would be no more than an exploded or expanded local library. We have no intention of seeing the nation develop ten strong local libraries under the guise of being regional libraries. We view the regional medical library as a wholesale operation which has supportive and switching mechanisms to backstop the local library.

I am very much interested in your estimates here because they are not very much different from our own, although we didn't arrive at these figures the same way you did.

MISS KEENAN: I agree wholeheartedly with some of the comments Dr. Cummings has just made: That a tremendous amount has to be done by the profession to increase our transmission facilities. We are at the present time so concerned with cost and the relative value of doing things by hand, as opposed to doing them by advanced machine methods.

I think the library profession is too concerned with staying in the same rut it's been in for the past hundred years, and I think we've got to look at what industry has done, what other communication media have done in providing proper service to the American public, and I think we've got to come up to that level very soon. However, I'm afraid we are just going to be left behind, and you are going to find your information specialists take over while you sit down and ask yourselves, well, what happened to us? Why don't we do this, do that, why didn't we improve our methods here and there?

I think our transmission of information will have to utilize the most up-to-date methods. We've got to be aware of them and be on top of them; and even though it's going to cost money, well, all service costs money. We may say it's too expensive to provide free service here and there, but we should consider that all library service costs money, even in carrying on traditional service.

Q: Dr. Knox some time ago took the profession to task, and I think in a somewhat similar vein. Wasn't it Vosper who did have a few comments on Dr. Knox's speech, and if I recall correctly, it wasn't lack of imagination or initiative for which we might have to be criticized but to a great extent lack of support; so perhaps the imagination is there but the lobbying has failed.

Q: Well now, you have to meet a payroll and expense, but I don't know how you can put a dollars-and-cents value on service. I don't know how you can say that it's worth $5 to this physician to have this particular bit of information at such and such a time.

Q: We talked a lot about this, but I'm concerned about the physician in the organization: his place in this region.

We talked about the concept of a region. May I make an example to bring out my idea?

Say that we decided there was a particular region in the Northwest; that a physician in Idaho didn't know that he belonged to this region. What is his role, what is his relationship? Can he still go to the Library of Medicine directly? Can he come to this region?

Now if you tie it together electronically it will automatically take him in the channel he wants, wouldn't it?

MISS KEENAN: Yes.

Q: What is the relationship of this doctor? After all, it's our clientele that we want to consider.

MISS KEENAN: Well, isn't this part of your publicity?

Q: Your interviewer or field representative?

MISS KEENAN: Isn't this part of your field representative's duties?

Q: Through their local societies.

DR. CUMMINGS: I think this is a crucial question:

I would think that this body of users--physicians, students, scientists, other health personnel--ought to be related to hospital libraries and to other local resources first. Then he should have access to a regional library if needed. A private practitioner has come from Billings, Montana to learn where he will get his library services. He wants to know just what you've asked: "Where will I get the information I need and how fast will I get it?" He very properly took me to task because he learned that it takes two weeks for materials to get from NLM to his office when he sometimes needs it in two days.

This, to me, is the crucial question: How does the regional medical library propose to service this physician and cut the transfer time to eight hours from fourteen days? I think it can do it, but not by two or three 914's, or having a big warehouse of materials. I think it can do it through other delivery systems.

With respect to cost, I don't think the question is, how much is this information worth. It can be worth the patient's life, if it gets to the physician in time.

We have to ask: "How much does each alternative pathway cost? How much does it cost to get information to the practitioner by microform, by Xerox copy, by dataphone, by telex cable?"

This is the kind of data we need, and in this context I think each region might examine the various possibilities and make studies which would suggest that, for example, for the Pacific Northwest, it's better to do it this way than that way. That is why I was very much interested in the experience Mr. Fraser shared with us. I don't know if the field representatives carry information to doctors as do the drug detail men, but there has been one formal report that recommended we do just that. I hope that sometime during the course of the meeting there will be some discussion of various ways in which such a system might serve this area.

MISS KEENAN: Perhaps I should just explain one thing. In putting a box over here for physicians, students, scientists, and so forth, I am referring to the unaffiliated people--not those who are already part of the clientele of the library; they are set out in the center box. These are people who would not have access to a medical library of any kind.

Q: How would they have access to a regional medical center collection more than they would to some of these other institutions?

MISS KEENAN: I think they are going to have access to it by telephone, by mail, and so on. These are still very conventional forms, but unless a Teletype system, or a system similar to what the newspapers use, becomes more widespread throughout the system, we will still have to live with it.

Q: Occasions do arise where we deliver something to a physician in Alaska within 48 hours, and it's very easy: He phones and we deliver it by one of these means, but this is an exceptional case. However, it could be done normally; it isn't done now.

Q: Do you suggest that within each regional medical library there be an intra-mail and extra-mail function?

MISS KEENAN: Yes.

Q: The extra-mail function takes care of the off-campus situation.

MISS KEENAN: This depends on what kind of a library is going to be designated as a regional medical library. If it's going to be a large Society library, this library already has, perhaps, as its primary clientele the entire region; and in this case it just needs to extend the service.

Do you think your regional medical library would be a better system if it were just expanded in its precedents and services and with an integrated staff?

Q: Yes, and that service would have to be what I would call a documental approach similar perhaps to the activity of the field representatives. Let people know what you got, anticipate their needs if you can. You know certain researchers in the area are working on a problem; as you check your materials you are aware of this; you prepare a profile on this, and you ship new material to the researcher immediately, without waiting to have it requested.

I think you can do this better if you have the people trained for this. You have a problem because you don't have enough sub-specialists. I would prefer to have a person in the library working, for example, entirely with serials, who is aware of some of these service problems and tries to help the public, rather than separate these two functions.

Q: Some libraries have librarians scanning the material, but usually it's for individuals.

Q: Well, this will probably come about anyway in some mechanization method, so a lot of these examination and information processes would be by such new means.

Q: I don't know whether this has been established or not, but I can't see why a regional library, for example, knowing there is an outbreak of a certain communicable disease in an area, and knowing that there are only two or three physicians in the area who might need some information regarding it they might not anticipate this demand.

MISS KEENAN: Let me make a comment on this, too: If you are envisioning enlargement and integration of the staff, it seems to me you have to revise your policies insofar as service to your clientele is concerned. And another point should be made here. If you are going to circulate one volume of an encyclopedia to a physician, you had better do it to your student, too; otherwise you are going to have one awful mess.

Q: Well, of course, there are some human relations problems.

MISS KEENAN: But you can't have one set of rules for your primary clientele walking in and have an entirely different set of rules for your regional clientele.

Q: That is why I prefer not to have the two separate, for fear it will be.

Q: You would have duplicate material, really.

MISS KEENAN: But you've got to be careful, too, that you have your material on hand for use by whatever transmission facilities you employ for your regional clientele and not have it out to your primary clientele so that it's not available to the regional. I think these are some of the difficulties you might run into.

May 12, 1966 AFTERNOON SESSION

REPORTS OF GROUP MEETINGS

MR. ALLEN: This is the first section of our joint session, and the speaker discussion leaders have already met with the various groups. They have done their job well, and now it is going to be audience participation time, and we hope you do your job well by having a lot of questions for the experts.

Before we get into the actual formal part of the program, I have a very pleasant duty to perform, and that is to introduce a very distinguished visitor that we have with us this afternoon, Dr. Chitale, the Librarian, Central Medical Library of India. She has been at the National Library of Medicine since the first part of March, studying the Library's methods, administration, programs, and various other aspects of the National Library development.

We are glad to have you here and we hope you have a pleasant stay.

In each of the discussion groups we planted some people we thought would act as catalysts between those groups and the larger group here, and the first one I'm going to call on is Miss Maryan Reynolds who is the Librarian of the State of Washington. She has been and continues to be vitally interested in all aspects of regional library development, and she is going to be the reporter on Group 1, Interlibrary Loan Function. Miss Reynolds.

MISS REYNOLDS: After considering the discussion this morning, it seems best to approach it by covering the broad points and not so much the specifics that were presented because Miss Annan's paper will be available to you.

The points that were made from the years of experience of the New York Academy of Medicine Library, serving as an interlibrary loan center, appeared to be the following:

That as we develop our regional library programs we must be sure to establish rules that take into consideration the kinds of problems that will arise if we are operating at odds with one another.

In this area it was pointed out that when one becomes exceedingly generous with free copies, he can suddenly discover himself overwhelmed with requests. Care must be taken to meet the needs without opening the doors to the unnecessary.

We must be sure to consider all of the publics that need to be served. While there are studies now or soon to be available on users of medical libraries which indicate that there are some questions even among the kinds of users, it may very well be that further research in this area is needed.

We also need to consider the kinds of institutions that will be involved and even the possible effect on regional service, through the decline of the society libraries. Does this, then, increase the problem of the kinds of users to be served?

We must be sure our staffs are committed to the concept of interlibrary loan because it is upon the staff that the success or failure rests.

We must remember the problems of the control and protection of materials, not to be overly protective, but to be sure that we are not overly careless.

We will certainly need to consider modern methods that can be utilized, but if we are going to be realistic, we probably need to face the fact that this will not be an immediate answer, and that we will have to begin our programs with less sophisticated hardware than perhaps we are thinking will be possible.

We must also remember the copyright aspect of our interlibrary loan problems.

MR. ALLEN: Thank you, Miss Reynolds. I will ask you to hold your questions until we get through with all of the reporters, and then we will give you a chance to ask questions from the floor.

To give the conference an international flavor, and to have a guest from our sister institution to the north, we asked Mr. Douglas McInnes of the Biomedical Library, University of British Columbia, to be the reporter for Group 2, dealing with the Information Center Function, which was Miss Darling's group.

MR. McINNES: Miss Darling introduced the topic by pointing out the appropriateness of this area as a regional service area because of its historical background of cooperation, and we went on from that to discuss several aspects of cooperation.

One was the bibliographic search center such as one that might operate with the MEDLARS tapes, the second, the science information center like the Brain Information Service, UCLA, and then we went on to discuss some specific problems.

In relation to the bibliographic search center, we heard of some of the problems involved in decentralizing the MEDLARS system, that of conversion of the tapes to be used on IBM equipment, the problems of the equipment itself, which may indeed be too sophisticated for the MEDLARS tapes, that is, to be used economically with the tapes.

The different approach that one might follow in processing searches mechanically was touched on, too. That is, the importance of extreme accuracy in asking the question because, of course, the machine can't jump to conclusions, as we might in looking at searches manually.

Throughout the morning, the problem was referred to of finding staff suitably trained with science backgrounds who could then receive training in the MEDLARS system, specifically, training in indexing because, of course, it is important to understand the method of indexing in order to pose bibliographic searches to the equipment. The necessity of having training in doing the searches themselves, although, here also, the similarities with manual searches were stressed.

We went over the search procedure itself, and Miss Darling commented on the forms that are being used at UCLA and pointed out how librarians could assist in making the questions specific, in asking for a relevant citation, if the user can supply one. All of these factors contribute to making the search a successful one. We touched on the actual process, but I am sure we didn't have time to go into enough detail to report on it adequately.

We looked at a list of 105 searches that have been tried at UCLA and we learned why some of them were unsuccessful, e.g., the very specific ones for which no citations were found, the very broad ones which produced as many as 2,000 references on a particular question. We learned that in the case of a search that wasn't as successful as was hoped, usually the user was asked if he could supply a relevant citation that would get the search back on the track.

We also looked at the forms that the user fills out in order to provide the feedback necessary to keep improving the system. I am referring here to the type of information that will tell whether the number of citations found was adequate or whether it was too large, whether the citations were relevant and if they weren't relevant, why not, whether the search was received in time, and general comments that the user might like to make. We did see slides showing the format of the product of the search, as well. Miss Darling also described science information centers, or science analysis centers. We noted the difference between this type of center and the type that MEDLARS might typify, in that usually the area covered by the science information center might be more specific, closely related to research being done at the institution and it might rely on something like MEDLARS for much of its source information.

Here, the example was the Brain Information Service at UCLA. We found that, again, staff was one of the main problems. People with science backgrounds had to be found who could work with the research person, learn as much as possible exactly what he is doing, visit the labs, go to conferences, find the best way of helping him in his work, in preparation of review papers, and in channeling the information to him.

I was interested to learn that the Brain Information Service not only uses the MEDLARS tapes as a source of information but also goes back to pick up retrospective citations that appeared before the MEDLARS tapes were begun. I think Miss Darling mentioned that 26,000 retrospective citations have now been included in the information system; that additional citations are being provided from certain basic journals in neurology that are air mailed to the institute and indexed immediately.

We discussed briefly the translation service that might be found at an information center, and I think all of us are very familiar with the problem in locating translations in the present sources. The alternatives were mentioned, that is, keeping a file of translators' addresses, of providing translation service on a contract basis, which would be paid by the user. I think there was general agreement that it was too expensive to give finished translations, but people working closely with research programs could, with their language ability, at least provide rough translations and the finished translation would come later.

We touched on electronic transmission. Miss Darling mentioned TIP, the Technical Information Project, at MIT and pointed out that 27 elite physics journals are indexed including the bibliographies of the articles in these journals; that the resulting citations can be displayed on 150 monitors. The idea of displaying information visually is particularly interesting.

We discussed facsimile transmission by Xerox over long distances, and learned of an experiment between Davis and the University of Nevada, where I believe the first item transmitted was a list of library school graduates from the University of California and the comment was made that it could have been delivered less expensively by taxi. Still, the possibilities of facsimile transmission are tremendous.

In our brief discussion period following Miss Darling's talk we touched on one or two problems that I think were of concern to us, particularly the problem of relating a MEDLARS-type system to the general practitioner. And we felt that there was already a tremendous gap between the clinician and the research person and wondered whether the MEDLARS system might increase the gap, rather than narrow it.

The result of this discussion was that we wanted to bring to the group's attention the need to reduce the time lag in getting information to the rural practitioner, to build into an information system something like, for example, a poison information service which could operate within the same building to provide up-to-date information as rapidly as possible to the man who was actually working in the field. And I think we felt that the need for speed here was equally as important as to the research worker.

MR. ALLEN: Thank you very kindly. That's a very interesting presentation and I now can understand why you were late having covered a lot of territory.

MISS DARLING: May I just make one correction to what Doug reported about the IBM equipment. What I said was that the direct couple system, using a 7040 IBM, working with a 7094, was very sophisticated and more difficult to have function properly than the stand-alone 7094 system would be. They both will work but it takes a little bit more maneuvering with the hardware with the direct couple.

MR. ALLEN: Thank you. The third group, meeting with Miss Keenan, were charged with discussing the Quantitative Aspects of Regional Medical Library Service; and I understand this group talked about budgets and staffing and personnel, and the reporter for this session is Miss Margaret Hughes, the Librarian of the University of Oregon Medical School. Miss Hughes, would you give your report, please.

MISS HUGHES: Really, it should be Miss Keenan who gives this report because it is quite long and involved and, I know, required a great deal of research to prepare it.

I think that I should read the first page in its entirety because some of you may not be aware of this particular aspect. The title of our group discussions was the Quantitative Aspects of Regional Medical Library Service.

> As you know, the Medical Library Assistance Act was passed into law by President Johnson on October 22, 1965, thereby enabling the Public Health Service to underwrite the nation-wide improvement of medical libraries. One of the provisions of this law is to 'assist in the development of a national system of regional medical libraries, each of which would have facilities of sufficient depth and scope to supplement the services of other medical libraries within the region served by it.'
>
> To accomplish this, the law further states that sums not to exceed $2,500,000 per fiscal year may be appropriated and utilized for acquisitions, technical processing, duplicating equipment, transmission mechanisms, and construction, renovation, rehabilitation, or expansion of the physical plant. These grants may be made to existing public or private non-profit medical libraries, providing said libraries agree to modify and increase their library resources so as to be able to provide supporting services, and to provide free loan services to qualified users.
>
> Monies awarded for construction projects are contingent upon the facility remaining a medical library for the next twenty years.

Miss Keenan considered seven main topics. First were the organizational and administrative facets of national and regional libraries and the clientele to be served, the services to be offered to the region, the transmission and data processing equipment to establish this, the staff required for such an operation, and then the physical plant for a regional center.

In all of the discussion in the morning the main point to be remembered is that service given to the region was stressed, rather than the system itself, service to the individual physician and to the other members of the health sciences group.

Neither regional library service nor regional medical library service are new concepts. Some systems in which those were reviewed are now in operation, as in Philadelphia and Wisconsin. They have been in existence for many years.

A regional library service must be defined as an association of libraries based on geographical grouping, including university, special, as well as public libraries. The main purpose is to meet the special requirements of the users of the constituent libraries.

It was thought that there might be several primary regions to be established throughout the United States for regional medical library service, e.g., Seattle, Los Angeles, Dallas, Chicago, Miami, New York and Boston combined, Washington, D.C. Another plan called for a library to provide service to a population of about 2,000 users. None of these plans proposed by outside organizations was acceptable to the group. Neither the number of regions nor of users per regional medical library appeared to be realistic.

One of the major factors to be considered in determining the extent of a medical library region is the size of the clientele to be served. Hopefully, the medical populations will be equalized among the various regions, if not at first, at least eventually, through the establishment of additional regional centers.

Once the region has been defined, the first facts to be determined are the exact quantity of the region's medical clientele and the extent of service which can be reasonably expected to be extended to this clientele. A typical medical region will undoubtedly have one or more schools in the health sciences, namely, medicine, dentistry, pharmacy, public health, osteopathy, veterinary medicine, nursing, and other auxiliary medical sciences. The student enrollment and faculty figures are normally available from the school catalogs and data on the various libraries serving these schools, and the extent of the services provided by the libraries could be ascertained, through the Medical Library Association's Committee on Surveys and Statistics and through the Association of American Medical Colleges.

Information on the interlibrary loan activity of these libraries may provide estimates on the projected use of the medical library by the academic medical community.

Not all loan activities will be transferred to the regional library, since it will always be faster and more economical to borrow an item from a larger library across the street than to wait one to three days for the loan to come from the regional library.

Demands made upon a regional library by industrial medical libraries in the region should perhaps be subject to a quota of free services, and maybe a fee attached to whatever services above that should be established.

We mainly serve physicians, but we also have other parts of our community to serve. We have elementary and high school students and laymen to take care of, as well as the medical men in our community and those who are in the ancillary services.

Once the clientele to be served within the region has been defined, the next step is to decide what range of library service is to be given.

Of immediate concern to the regional center staff is the circulation of library materials to individuals, institutions, and other libraries as specified in the Medical Library Assistance Act. This service is to be extended free of charge.

In order to adequately serve a clientele which is only partially known, the circulation system must be adaptable to the varying demands made upon it. Requests for items not held by the regional library could be forwarded directly to other regions, or special libraries, or to the National Library of Medicine by the regional library staff.

The percentage of individuals requesting direct loans might be estimated as ranging from 15 to 25 per cent at first, but as this service becomes known, the percentage would rise considerably. The quality of the interlibrary loan services will vary from region to region. In this area, of course, we have the Pacific Northwest Bibliographic Center and requests might be channeled through it.

This regional library should assume the responsibility for 90 to 95 per cent of the loans now being forwarded to the National Library of Medicine. This should certainly assist the National Library of Medicine in giving service to the nation as a whole.

Based on available data, most large medical school libraries seem to be lending only 2 to 10 per cent of their total circulation as interlibrary loans. I think that this service, in some instances, is a little higher. I know in our particular library the interlibrary loan service is a very large one, and I am sure it is in most of the West Coast because we are so far flung.

Once major lending restrictions are removed through sending material directly as Xerox copies and free to the individual, this proportion of interlibrary loans to the total circulation will increase.

Extensive reference service to individuals and institutions should be offered by the staff of the regional library, as well as the staff of the regional center collection and should comprise the following activities:

Selected bibliographies should be compiled on any health related subject, utilizing available medical indexes. Requests which can be filled by the use of the Index Medicus should be referred to the local MEDLARS center.

Translations of short articles should be undertaken. Direct communication channels, either telephone or teletype, with an SLA translation center should be useful in this project. Factfinding, which is commonly referred to as ready reference, should form part of the daily routine of the regional library service.

Reader guidance can be offered on a limited basis, since this would be done better by the local units where the user's needs can be more fully explored.

Another important function of the medical center is providing consultation, training and field service. And it may be that this field service would be one of the most important items of a regional library setup.

Initially, the staff should contact each medical library in the region to explain the services being offered by the regional library and to enlist their cooperation and active participation.

In order to make its resources known, the regional library should distribute information on its current acquisitions, either by means of a printed list, which would come from a computer based data processing program, or by cataloging slips or cards which could be incorporated in the local catalogs.

Cooperative agreements regarding current resources should be made with existing specialized libraries of the region, therefore making available to all concerned data on 90 to 95 per cent of all new publications in the health sciences.

Once the services to be offered have been determined, immediate steps should be taken to the implementation of these services. Of the greatest importance is the hiring of professionally trained librarians and clerical assistants. Suggestions were made for a staff. This staff would consist of a director who would have an administrative assistant and a full-time secretary, one professional circulation librarian, two clerical assistants, two reference librarians, and a technical processing assistant, two professionals, and two clerical assistants, and one field representative. And, as I said before, probably the field representative would be a very important adjunct to the services in relating to the region's individual components because it would be important that a librarian attend the local meetings of the medical societies as they are held about the state or the region, to indicate the extent of resources and scope of service.

The gaps in the coverage of the individual library should be filled as rapidly as possible. The point was brought up about older and less used materials, should they be brought together in one place, a central research center perhaps, such as is in the Midwest, or should they be housed regionally within the area immediately at hand.

Duplicate copies of heavily used books should be provided and the condition of the collection itself should be definitely gone over to see that it is in good repair.

Indexes should be available, many of them, in areas where they can be consulted readily.

Back files should be filled in at once, as soon as possible, either on microfilm or in some other form.

It was suggested that probably two to three 914 Xerox copiers should be provided in such a regional library and that microfilm readers and microcard readers be provided, and that there should be access to a data processing center.

There should be direct lines to the various component parts of the regional area, to the substations, to the libraries that are working through the regional library and are giving assistance to it through their collection. Maybe by teletype, by closed-circuit TV--the means of giving information from one library to another and one individual to another, to a physician, e.g., are numerous.

The costs, of course, are important and this information will be given and printed in Miss Keenan's paper. They are impressive.

But the main thing to keep in mind is the up-grading of the local medical library through the money provided by the Medical Library Assistance Act. This is truly service to the individual physician and to those in the health sciences.

MR. ALLEN: Thank you very much, Miss Hughes. That was an interesting session, I am sure.

Now we are ready for the questions.

Discussion

MISS DARLING: May I suggest a question to Dr. White relating to a comment made in our session. In the report, you remember, the statement was made that bibliographic searching through MEDLARS might widen the gap between the physician and the research man. I think that it would be interesting to have Dr. White's point of view.

DR. WHITE: I must say, I am certainly not a librarian. In fact, I am probably guilty of not using librarians enough which may become evident in a few moments. But my concern has been with the transmission of current medical information to practitioners.

My comment this morning was that it seemed to me that this entire program is directed toward researchers, and I am wondering if by emphasis in the direction of titles and bibliographies, which are related to research activities more than they are to the day to day practice of medicine, this will not widen the gap between the practicing physician and the researcher, perhaps because of the lack of attention to the practitioner's problems.

In Idaho we have no medical library of any substance which is generally used. We have two or three small ones, but certainly nothing of the kind of facility that you have in these centers here in Seattle, the University of Oregon, the University of California, and so on. That is to say, we are really starting with a deficit in this question of providing information services.

I was intrigued by the questions on the program, but if you will look at the left-hand column of the inner page, there are a series of seven questions listed there and I think Questions 4, 5, and 6 relate very specifically to the kind of question I am asking here. Perhaps the conference chairman has asked these questions. In other words, what services are to be extended to what types of clientele under what conditions? What services do the members of the biomedical community in the region expect? What service can a regional library reasonably expect to furnish?

Maybe my question is what is a medical library? What is its function in 1966, the year 2000? Are we burdened perhaps by tradition to continue doing the things that we have always been doing?

I have raised these questions as a rank outsider to the library world, but these are things that I really feel we need to know. What can a physician do to get immediate medical information? The delay of four weeks, or six weeks, isn't very good if you are treating a patient who needs advanced chemotherapy for a carcinoma of some type, or who has had a certain kind of therapy and has come back to his local community and the physician there needs to know a little bit more about what is happening to this person. This may be true particularly if he is receiving the newer types of chemotherapy with a continuous injection of a specific drug. These things are happening; we do have these patients coming back into our area and our people need information.

I raised the question about poison control information. At the present time we have Poison Control Centers which are hooked up with a state institution or university, and this information is available by telephone. My question is, isn't it possible to make this more readily accessible through a television type of apparatus with which you can get the information while you are seeing the patient. Why couldn't this be in the emergency room of the hospital? Why shouldn't it be in the physician's office?

I think we need to get [illegible] concepts of the use of a television type of video matrix device where a practitioner located in Salmon, Idaho, has the same access to medical information as if he were in downtown Chicago. And to me, these are concepts which are worthy of exploration, and I am sure they are the kind of questions that the practicing profession would like to have answered. It takes, I believe, imagination. I don't think we should get concerned with dollars at this point in our life, as much as with the opportunity to save lives and the opportunity to give people in rural areas the same chance for survival that they might have in urban areas. I realize this is quite a question, but if there are answers, I would be delighted to hear them.

MISS REYNOLDS: I think it is only fair to report that in our group the question of the practicing physician was definitely considered, as well as the fact that currently in the libraries that are being used, many of the questions that come to them, come from industry, and from young people, and at the high school, not the college level. There is then a clientele that goes beyond the practicing physician, in terms of what libraries owe them. It isn't that they are being overlooked, but I think the point we made is that the kinds of things that are desirable may not be immediately available, so that we have an interim step that we may have to take in solving the problem.

DR. MILLS: I'm Dr. Mills from Seattle. I sympathize very much with Dr. White's question. I was just about to raise the same thought, and I understand also the answer, that it is very easy to multiply, maybe not easy, but possible, at least, to multiply the services that the central academic or quasi-academic library now offers to its primary clientele.

It is much more difficult, and yet much more essential to get this outreach of the library and to develop the flow of information beyond the ten-mile limit from the campus because these are the people who stand the most in need of continuing education. These are the people whom Congress had in mind serving when the heart disease, cancer, and stroke, and the regional library programs were established. Actually, they represent 85 per cent of the health sciences personnel at least, and presently probably 30 per cent of the library users.

The purpose of the program is to get these figures more into balance and to get this library used by the people who presently do not find their needs met by it, and who will not find their needs met by the MEDLARS program or any other information retrieval base that we talked about this morning.

The busy clinician has neither the time nor the energy, nor the waking hours to undertake extensive library study. He has a problem; he has to solve his problem right now or within two or three days. What he needs is the information center approach. He needs somebody to give him a good review article on a given subject. The practicing clinician who undertakes extensive research and is going to have a long bibliography on a paper he publishes isn't one man in a hundred, especially when you get away from a metropolitan center.

MISS EBERT: What do they do now?

DR. MILLS: They read the journals that come to them.

MISS EBERT: What if you have a problem right now with a patient and you need an answer, what do you do?

DR. MILLS: You do various things. In the first place, you have your own personal library, probably in the subject of immediate concern you have two or three journals, five maybe, then you talk to your friends, you talk to your colleagues. And really, this is close to the limit, or you will perhaps, as I did last week, write to a friend who you know is doing work in this field and ask him for references; you can get a good answer from Boston. But the medical library is very hard for the clinician to use and it doesn't really meet his needs that way. I think this is what we should be talking about presently.

MISS EBERT: This also is access to current research, isn't it? Isn't that what you mean, current research on a particular, specific problem.

DR. MILLS: Well, perhaps, but the need is not to go so deep. The need is to get current information. We made a distinction here, I think. You call up the information center, and ask is Daphne poisonous. This is one sort of thing that you need; then you will need, say, information on a given disease. But not ten references on it, rather one or two good review articles that are very current, relatively current.

MISS DARLING: Of course there is no reason, as we said this morning, not to use conventional reference service which answers questions like that and usually one can find a good review article quickly. There is a Bibliography of Medical Reviews which is also a product of MEDLARS which we didn't have time to talk about this morning; but I think one of the points that bothered some of us the most was the fact, if it couldn't be almost instantaneous.

Another point in that connection was that it is not possible to do all these things instantaneously at this time and that we have to go step by step and start with what we can.

There would be no reason why a physician in Timbuktu can't call the regional medical library and ask if there is a review article or some quick information, incorporating the latest research, on what he is interested in. I think that if you have well-trained people in the center, this can be done. However, for the data bank kind of thing where you have to answer in a minute whether Daphne leaves are poisonous or not, that means a development of a kind of data bank, which is somewhat different from library service.

DR. MILLS: We are on the same side now, but this morning we gave this point lip service for perhaps two minutes, and yet, this is the reason for this whole meeting.

MISS DARLING: But this morning I was simply giving you examples of different kinds of services. They happened to be in research fields because that is the field that I know about. But I had tried to make the point that the same kinds of services have to be designed at the same time for the practitioner and for the layman. I think we have to go step by step. So many people want us to use electronic transmission, and anything else they don't want to think about. But we are not at the point where we can do it. I think it is terribly important to try to go step by step toward a goal but not say, "Well, this won't do now." Many people in rural areas where there is no medical library have no idea of what they could get from one, and just by using the telephone.

DR. WHITE: I'm not sure but what we are talking about two different things. Number 1 is the traditional function of the library, which moves along in a relatively methodical pattern.

MISS DARLING: It doesn't have to be so methodical.

DR. WHITE: The other one is the need for a health science information service. Now the physician has been accused of not practicing good medicine because he picks up the "Physicians' Daily Reference," which was printed last October sometime, but the American Medical Association has just come out with a new book on current drugs, which gives access to drug information for physicians. But this is out of date by the time it's published because within the last two weeks perhaps there have been three or four drugs removed from the market. There is a lag here which, even though it is only a matter of two or three weeks, is still two or three weeks too long.

We have got to begin to provide some kind of current textbook of medicine which is immediately available and immediately updated with the kind of information we are talking about. I don't think the physician is concerned about who wrote this or when he wrote it, as long as it has been approved by what he would consider his peers. If this came out of the Mayo Clinic or Harvard or Columbia, the N.I.H., or any good medical center, who have said this is authenticated medical information, the best we know, here it is, use your judgment about it, I think we would up-grade the level of medical practice in the United States tremendously. But it is not available at the present time. Physicians, for example, are getting drug information as required by law out of pulling little pieces of folded paper, finely printed, out of drug packets, and this is the law of the land. It tries to guarantee in some way that the physician has this information.

I am simply suggesting that maybe the view of a library as a medical information center should be expanded to meet this need, which I do not believe is being met at the moment. Maybe it's not a library function; maybe it's a function of an entirely different type of organization. To me it is an unmet need which requires increasing and urgent attention, and I had hoped that MEDLARS and the National Library of Medicine would, in a sense, begin to fill this gap and perhaps way down the road this can be done by Medicare, Title 19. But if we are to maintain even the existing quality of health care, can we afford this sort of a gap? This is the problem as I see it.

MISS DARLING: Well, I agree; but, Dr. White, don't you think in the meanwhile people could immediately start by telephone or by mail using the places that are available.

MISS REYNOLDS: I think Miss Darling's point is not that this isn't needed, but that it takes time to get this service set up and working and that in the meantime information can be obtained. But there is lack of knowledge on how to use what already exists.

DR. NASH: You are asking for a change in the role of the whole library. You said that traditionally the library was a depository of knowledge and that we treat it with traditional means, and that we are also treating it with electronic means; but now the doctor says we have another function, we have a dissemination function that anticipates the needs of a doctor. Do we have a role as libraries somehow to get this information to them? May we disseminate what is coming to us? It may mean we have to go into a publishing program; it may mean providing new indices, or central lists, or new lists for our area that somehow get this information to as many places as needed so that a doctor in Pocatello could pick up a good diary, say at the University of Oregon and so that is where he calls immediately. It avoids calling the central area. But we change our function; we have to disseminate information beyond just providing what is asked for, and this may be through several means. Is this what is being demanded, that we need to change the whole role of the library?

MRS. TERRY: I would like to make a comment as a person concerned with publications. What Dr. White is asking for is not the thing that is available to the librarian. There is a publication lag in scientific journals of nine months. What you are saying when you talk about current information, as you have expressed it here, is what came out of the laboratory last night. There are records of this of course that are started in the research area in the hospitals that may extend into this area, but it is going to come out of medical records, perhaps, rather than the medical library which is still based, necessarily, on published information.

DR. NASH: Does it need to be? Can't we get these agencies that produce this information to feed it to us electronically so we have it immediately available?

MRS. TERRY: The only such program I know about is the one at the Tulane Medical Center, and they have a great deal of difficulty with premature information. They have to find some way of putting a hold on some information and treating essential information, information that is proved out, without giving you the results that aren't going to be duplicated tomorrow.

DR. LIEBERMAN: What you are saying is you need evaluation of this information, whether by seasoning, by time, or by authorative interpretation. Somewhere the information has to be evaluated before it is disseminated. And presently we do it with time.

MRS. TERRY: Well presently, an article that goes into a scientific journal is submitted to one, or two, or three referee editors who evaluate on the basis of experience. Well, this puts nine months into it.

The psychologists have gone to another system. They have a journal called Psychonomic science, in which a two-page article will be published without review. The responsibility rests with the investigator. This is very rapid method.

MISS KEENAN: I would just like to say that perhaps one of the functions of a regional library network is that there be these specialty collections and/or institutes which become a part of this network. And it seems to me that this is more the function of the regional medical library, to make information available from these institutions. But I do not feel that the practicing librarian should try to evaluate the information and say to the doctor, "Yes, this drug is poisonous." Unless you are going to have an M.D. as a librarian, I don't think we can be called upon to give that kind of service.

However, I do feel that we should be able to take the question from the practicing physician, whether he calls by telephone, by teletype, or any other means, and say, "Yes, sir, we know where a particular specialty could perhaps be best handled and let us contact that organization by phone, or by teletype, and try to get the information to you. Perhaps they could call you directly; perhaps we could suggest you call them, or they can call us and we'll call you back."

I don't feel that we should sit down and try and have the most up-to-date information and be the evaluators. I think you yourself have to be the evaluator.

MR. ALLEN: May I comment just a minute here? I am struck by your statement, "make available," and I am struck by this gentleman's emphasis on the missionary role that the librarian has got to play. He's saying to us, "You've actually got to come out to me in the field, wherever the field may be." Not just bring it to your shelf and store it in your little data banks, but you've got to go further than that: You've got to make a contact with me in the field. And I think this is going to be the important part: Once we get the information in this center and we piece it together in various ways, what are the avenues that are going to be open to us as librarians that will allow us to make these contacts with you?

Some of us, not all of us, see our role rather restricted, up to this point, in making information available. Well, is this enough? I think we've got to go further than this, or would some of my colleagues disagree with me?

MISS KEENAN: Isn't this perhaps the area in which a field representative of a regional library system can start making the information available to the rural areas and at least publicizing the services and information which are available. Unfortunately, even when you are trying to service a membership which is spread across the entire country and parts of the world, you find all too small a percentage of people who actually want to utilize this service. I think some of the impetus for utilizing this has got to come from the physicians themselves. They have got to want to improve themselves before you can say, "You improve."

DR. BOWMAN: I would like to put in a word for the poor old practitioner. I do not feel that medicine is being practiced quite as badly in the back areas as many people would lead us to believe.

I probably am in a back area myself, although we do have our own small medical center and we act as consultation center for even smaller towns in Montana. And what the practitioners usually do, if they have a problem, which frequently has to be solved within a few minutes or even seconds, at times, is to pick up the phone and call somebody in Billings, it might be me or one of the other practitioners there. And if we can't answer the question, then we will tell them who we think could and they will call someone in Denver, or Seattle, or Minneapolis. If I have a problem, I do the same thing. If I can't answer it myself through our small medical library, then I will call somebody in Seattle or Salt Lake or Denver. And I usually call the man because a specialist in a field will know which of several review articles, for example, is worth reading. The other one may be good and two may be not worth a darn. He will probably be up on the latest information, and he will know how much of the stuff which comes out is solid material and how much is not.

The problem, if you don't have an M.D. in your library, is how to evaluate material which comes out. We get perhaps 20 pamphlets and magazines every month, in addition to a number of legitimate journals that I subscribe to, and these throw-away medical journals come out with all the latest reports from conferences which have not been digested at all. Many of them are inaccurate as far as their emphasis is concerned and they may be discredited within the next month or two. I just think that there is a lot to be gained by a settling period, whereby new information can settle down and the inaccuracies can be gotten rid of before the basic information can then be transmitted to the practitioner.

MR. FRASER: I think I should point out that the type of service that the doctors have been talking about, this direct information service, is being given to the physicians in British Columbia. We have received requests from doctors all over the province and if we receive a request in the mail in the morning, the material is out in photocopy form the same day. So that there is quite a rapid information service operating now in the Pacific Northwest Region.

MR. OPPENHEIMER: Is the question that comes to the British Columbia Medical Library Service the kind that calls for a specific reference, or is it a review-type, subject oriented question?

MR. FRASER: Most of them are both.

DR. LIEBERMAN: This still doesn't provide Dr. White with his answer, because it is the fact that the library should not just continue to build its collection and be available, if the question comes in but should also have the outgoing responsibility of selected dissemination or some other aspect of the program. It may perhaps require publication. This is one of the questions that needs to be resolved because the material must be brought to the attention of the person who needs it. He is not aware of the wide range of publications, and it is only the person who is accustomed to using libraries, and many people are not, who will pick up the telephone or send the request in. And therefore, we're missing the whole group that doesn't do this on a regular basis but does it on a person-to-person consultation basis. You call your friend or colleague and then start from that point. So we must think of some method of getting the information out because the dissemination function is the really basic one, as far as I'm concerned.

MISS HUGHES: Well, you can advertise, put your ad in the bulletin of the local medical society. The bulletin the Multnomah County Medical Society publishes each month a very fine newsletter, and in it each month we have information about the new books that we have acquired, and the services that are available to the physicians in the state of Oregon. Material is sent to them. If they ask for a specific request and it's something that is current we do not want to lend, we Xerox it and send it to them. If it is a question that requires our making a decision as to what we think he would like to have, then we send the material itself because he would not want to pay for the information which may not be relevant. And we ask them specifically to let us know whether we hit the nail on the head; did we give you the information you wanted at the time you wanted it and was it there on time? So I think maybe that it is a little bit of advertising we have to do and I think that is what Miss Keenan has very forcefully brought forth in her discussion this morning.

MISS REYNOLDS: I still think that the point Dr. White made about the immediate need of the physician who is in the process of making a diagnosis, wanting to lift the telephone, dial, and have on the television set the information that he could read that would be useful to him there, is not being met.

DR. WHITE: This is correct. I'm certainly not talking about the rural practitioner. I was one for many years, and I find medicine is practiced in most rural communities. As a matter of fact, I wouldn't trade it for some downtown medicine I have seen, I tell you. Not particularly in connection with university centers but within four blocks of the center. So that I certainly agree with my colleague from Montana.

The other question concerns the evaluation of medical knowledge. I said this should be done by our peers. I doubt that I would want to take this chore on nor ask a library scientist to take it on. I think in the evaluation of any kind of information there are certain persons competent to do this.

I think what I tossed out here is perhaps a new dimension in library services, or in health information services. Perhaps this isn't a role of the library; perhaps it isn't the role that the medical library sees as its function. Maybe it's the role of the medical school per se, of the faculty, of the medical society, of something else, I don't know. I see it as a need and I don't see it being answered today or tomorrow or a year from today or tomorrow. But I think it is the kind of thing we must pursue.

We are all aware of the fact that medical knowledge is now doubling every ten years and in the field of nuclear biology we have doubled the amount of knowledge available in that science within the last ten years of what has been done in over two thousand years. The next doubling of knowledge, they tell me, in nuclear biology will occur in five years. The next doubling after that in 3-1/2 years.

Our patients are no longer asking us how do you apply a turpentine-stupe; they are beginning to ask us about their genes and genetics and who ought to be marrying whom and what kind of diseases are there. This requires a great deal of sophistication, and we've got to practice this kind of medicine in Idaho just as much as we do anywhere else.

What's going to be available to us on a day-to-day basis to do this? We will, hopefully, have better courses in continuing education for the health profession; but here we are faced with the problem of the graduate in medicine who within five years knows only three-fourths of what there is to know and within ten years if he hasn't brushed up, only knows one-half. This is our problem. And you can run as hard as you can but you can hardly catch up.

MISS DARLING: But, Dr. White, that really has to be caught up with through continuing education courses. The information service would never be adequate. It could only be a supplement to that, and there do need to be information services that could be either library based or not. Certainly it seems advantageous to have them so based. One practical one, as I said this morning, is the Parkinson Information Center in New York. It doesn't have electronic transmission; it puts out a bi-weekly bulletin and it's just giving references, but these have been gone over by scientists. The Bulletin has one section for the clinical work and another section for research work. I am sure information can be obtained very rapidly from there by telephone or by mail. It will be more rapid when there are practical transmission links available.

More starts of this kind need to be made.

DR. WHITE: I think we need this concept as a goal at this time.

MISS ANNAN: It seems to me that quite different types of information are involved, some could be provided by some type of what we now call current awareness programs. But I am sure that with the use of television in the future, there can and will be television programs that will obviate a good deal of our interlibrary loan. And I was very interested in the book about INTREX that MIT published recently. There are so many ideas in that, which may perhaps revolutionize our transmission of information. I think that interlibrary loans ten years from now may not be the problem that they are today.

MR. ALLEN: This afternoon, Mr. Fraser from British Columbia made a very short, but I think a very important comment, and I would like for him now to define what kind of a system he has in British Columbia.

MR. FRASER: It would take all afternoon to describe it fully, but I will try and be brief. A few years ago the doctors in British Columbia voted to assess themselves $25 per year for medical library service. We expect this to go up to $35 next year.

This provides not only a central reference library in Vancouver from which any number of references are sent out to doctors all over the province by mail, by telephone. Sometimes we even get telegrams. Local doctors use the library directly. We provide a hundred pages of photocopy free of charge and after that we charge from ten cents per page up to two hundred pages and then twenty cents per page. So much for the central library service which operates the way any such information service does.

In addition to that we have allowed $10 of the $25 per doctor to go back into the hospital libraries, again to build up hospital library collections around the Province. So not only do we have a good central library service, but we are also building up a good basic library service for doctors to use directly in their own hospitals. There are 43 of these in British Columbia now, and this number will grow as the Province grows.

In addition to that, I, as the Chief Librarian, do a great deal of traveling in the province. I try to visit each hospital library at least once a year, speak to medical groups, let them know over and over again what sort of service is available and how they can get it, so that there is a lot of dissemination of information to doctors.

Occasionally we will work with local doctors on current-awareness programs; and, for a number of doctors, we are xeroxing pages in the Index Medicus on certain subjects. I am sure most libraries offer this type of service, but I think the unique feature about British Columbia, and the one that I think is working very well, is this development of the basic collections in hospital libraries right where the doctors are practicing.

MR. ALLEN: Thank you very kindly. That is very helpful.

DR. CHRISTENSEN: I am Dr. Christensen from Eugene.

To further overload the medical opinion around here and to explain some of the things I will say, I would like you to know that I am a Director of Medical Education at a community hospital of about 360 beds in Eugene, Oregon, in addition to practicing medicine. I would like to endorse, particularly, the concept which Mr. Fraser has described, and I think we have been a little bit in error this afternoon in discussing libraries as a single breed of cat. I think we must admit that we have got more than one kind of medical library.

I think there is one which will do all these exotic things which have been described, such as the one which we have been trying to promote in Eugene. There is no local opposition, the management endorses it very enthusiastically, the lay board as well as all the other people who are in medicine. I would like to point out that the only excuse for all this talk is improvement of medical care.

If we are talking about medical libraries, I couldn't care less about the health of the librarian, but I am concerned about the caliber of medical care. We just touched for a moment on the business of continuing education in medicine. These are inseparable things. It is our feeling in Eugene, at least at Sacred Heart Hospital, that a hospital library is not a community hospital library but a hospital library which is community oriented.

I think the more we are involved with the public, the better we will probably be motivated to keep our skirts clean, and I would think that a good community hospital library would serve anyone who is interested in a problem in health or medicine. I would think that ideally it would provide the easiest means possible for the physician and for other interested people to get information. I don't think I would necessarily try to shove it down their throats, but I think I could make it pleasant. I think I could make the involvement with processes like the current private and public programs that deal with such aspects as heart, cancer, mental health. I think a central meeting place should be provided. I would like to make this available in my library. I would like to get more involved with the university, which happens by the grace of God and poor planning, to be across the street from my office. I can hardly speak about the many things which I think a library can be. I think that stands to be determined, but I think there is basically a difference between the library which we have been discussing and the kind which involves most of us in the practice of medicine, and I think the British Columbia idea probably comes closer to anything that we have even thought of here. Thank you.

MR. ALLEN: A very interesting comment.

Some librarians ought to pick up this gauntlet here now and speak to some of these questions. It seems as if there is a considerable job to be done here. How are we going to do this, you practitioners of a profession?

MISS ANNAN: I would like to make one comment. I had a very interesting discussion with Dr. Lieberman at lunch about one of the great handicaps we have today: the lack of trained personnel. We not only have a lack of trained personnel to carry out all of these things, we also lack the personnel to train the newcomers. I think this is the greatest problem we have, and no matter how sophisticated our systems are, no matter how fine our resources are, we are going to need, above all, well and highly trained and highly skilled personnel on all levels and with expertise in languages and sciences.

I see this as our greatest challenge.

I think this is a challenge to the Library School people, too; but I think relief is desperately needed.

Q: I would like to raise a point in response to your idea of community hospitals. It's all very well to have the collections available in a variety of institutions such as you have mentioned in British Columbia, and to reach each of these hospitals once a year; but I kept wondering as you were reporting, what happens the other days of the year when you are not there? That is, I was thinking in terms of staff for those hospitals because you can acquire material, and even there, someone has to do the acquisition work. It does seem as though a great deal of the problem needs to be directed at the matter of staffing the program and how we can accomplish this and what our needs are in this region along that line?

DR. BOWMAN: In Montana we do not have any full-time staff in the libraries that I am connected with. We have medical record librarians in the hospitals whose part-time duty it is to keep these very small libraries going, but we do not have any people who are really trained; and I think in most of these areas it will fall on the doctors to decide how these libraries are going to be run and to order the journals, hire someone to see that they are bound and kept in reasonable order.

MR. FRASER: I may be able to partially answer the doctor. We do order and catalog and process all the books for the hospital libraries, and although selection is left to the local doctors, they are pushed and controlled and encouraged and guided and cajoled in every way possible to collect a good basic and balanced library.

MISS REYNOLDS: Well, you challenged us with coming up with some solutions here to this problem of having more information readily available in the communities. Possibly the approach that we are using with our institutional libraries can be extended to serve the medical communities, inasmuch as we have already gotten into this area with the community health centers which are directly tied into the institutional program. There will be professional guidance right from the beginning. There will be field visits. There will be contacts by librarians with the people who are going to be needing the information.

We are still trying to avoid having unnecessary duplication. We need to find out what the really critical needs are before we get into a full-scale acquisition program. Staff will be added as fast as we can find the people who can perform the jobs to be out in the communities, in the institutions, still coordinating within their community the needs of the medical profession.

We had not taken our activity beyond the staff involved in the institution and community health facilities themselves, but it could cover more ground. We planned to add a computer as soon as we can get it, but we have to find out what all the problems are before we can have a program. This all takes time.

MR. ALLEN: We don't want to spend all of our time on this particular aspect, as we need to cover some more ground. And to switch over a little bit, since Miss Darling has recently gone through the problems of staffing a center, could you tell us what your difficulties were, how you met them, what kind of a staff you looked for and found, was the staff adequate, did you have to pay a premium to get them, did paying these people a premium, if you did pay them a premium, cause you any other morale problems in your library system?

MISS DARLING: I hope I can remember all these questions. But I might say I feel as if I am always walking on the edge of a precipice because while the people I have are quite adequate, there is no way of knowing when they will depart or when someone else will want them. I have hardly a member on my staff right now that someone else isn't after because we have been doing some fairly progressive things.

We have had a training program for five years, so we are known as a place where people might be recruited.

Let me mention remuneration, first of all, and I think my comments would be true in any academic environment. We must go by the salary scale of our institution. It doesn't matter where the money comes from, we still must go by the classification and pay scale there. I was talking at lunch with Mrs. Terry and we both have run into this problem, that our universities don't have any classification for information specialists. The Personnel Office has been very receptive in our case and has allowed me to use the library classification for people without library school degrees. They are however required to have had some literature searching experience and to have languages and subject background.

Now so far as actually finding them goes, the bigger the center you are in, or the bigger the community, the better your chances are. There are just more of these scarce people in that kind of an area, but they are present even if in smaller numbers in any community. For the MEDLARS station there was an adequate person on our staff who had been with us just one year. He is now the head of the search section. He turned out to be very well oriented toward information science and to have a quick grasp of working with machines. This was a very fortunate development for us.

One of our interns from the previous year was a biology major and had experience working in laboratories. She functions very well.

A third staff member used to work for an aircraft manufacturer and had done subject indexing. I knew about her because she came to do literature searching for her company in our library and inquired about going to the library school.

For the Brain Information Service it's more important than ever to have knowledge in the neurophysiological field and neurochemical field, if possible. But even on university campuses as large as ours, it's not easy to find people with such qualifications.

On my recruiting trip for our training program, I was able to interview a candidate in the National Science Foundation's Science Information training program at the University of Illinois. There are not many people in this, but I was lucky enough to be able to recruit the first graduate from that school. This young woman had a bachelors degree in biological sciences. During her library school year she had a choice of getting a degree in librarianship or physiology. She chose to get a degree in librarianship while she worked as a literature searcher with members of the physiology department, so getting some extra training. I also was able to recruit an intern from the National Library of Medicine.

It's just by chance and by golly, it seems to me, that you come on to people. You have to be constantly alert and have your needs always in the back of your mind, and if you don't need people today, you will probably need them tomorrow. Try to keep your contacts with young people who are just finishing either a degree in science or finishing library school, or who are promising.

Did I answer all the questions?

MR. ALLEN: I think so. I think we have a wonderful opportunity. We have a Director of a Library School, an important Library School on the West

Coast, sitting in this audience, and we ought to try to give him some advice as to what he needs to do in order to get us to entice, or to bring to the library school and to train the kind of people that are in great shortage now. We don't have them. What is it we are going to have to do to get this very specialized librarian? I am not talking about an information specialist now; I am talking about a very specialized librarian who is an information specialist in this particular area of activity because we will need these people in this region.

Now how do we advise him as to how to go about getting these people and training them for us? Is it a subsidy we are talking about? Do we go and get the people and then pay them on a part-time basis and finance their education? Do we give them a scholarship? Do we pay them a premium salary?

All of these questions are part and parcel of this whole regional development, and it will fall flat on its face unless we come up with these people, or we may see a different type of a profession growing over here, and this I think is of vital interest to every professional librarian in this room.

MISS KEENAN: I wonder if I could just make a couple of comments on this subject. I just wonder if we couldn't improve the quality of courses being offered for the masters degree in library science. I think if you compare the masters degree in the library science program with a masters degree in any other subject field, that they are pretty far apart; and I think it needs to be improved considerably.

I think we need to put more substance into our library science courses. I think we need to provide more specialization. I think we need to coordinate a masters degree program in library technology with a masters degree program in a subject field, and I think there should be opportunity for a degree candidate to take some subject courses, not just what reference tools to use, how to use them, and not just how to catalog a book. I am not saying these are not necessary, they are, but I think the level of the graduate program in library science needs to be brought up to date.

MISS DARLING: Well, I agree with you there, but you have to remember the library education program is only for one year and people are coming to it with subject bachelor degrees. To me, it has always seemed strange to get a masters degree for one year of education in librarianship.

MISS KEENAN: I think perhaps we should consider a longer time.

MISS DARLING: The problem is that we have to compete with all of the professions as they are now, and it's impossible at the salary scale to require two years. But it seems to me a minimum of two years is needed and especially for anyone who is going to specialize. We make it up, in part, through the internship programs and other kinds of special programs. In the internship programs we have, 50 per cent of the time is spent working in a medical library, doing professional tasks under supervision of experienced people, and 50 per cent is spent in continuing formal classes. Our staff, too, take class work. Either they take more languages or they take biological sciences, history of science, or something in the information science field. Even this is really slight, but it gives them a firmer base.

DR. LIEBERMAN: In response to your comment, not in defending library education, as such, I think it should be pointed out that a conference was held by the Office of Education in 1965. The resultant publication contains two papers which are notable. One by Dorothy Bevis, the Associate Director of the Library School here at the University of Washington, dealing with the prerequisite program, and the paper by Dean Swank of the University of California at Berkeley also concerned with the changes that are going to take place in library education. I believe that the majority of the accredited library schools today are taking this very seriously and are moving in the direction of improvements.

Here at Washington we have extended our program a quarter just because we feel that the job can't be done in an academic year. We now have two summer sessions every academic year. We thought at first that the whole practicing population would object: "Where are we going to get librarians, what are you keeping them in school so long for?" We have found though that this hasn't caused the problem that we thought it was going to originally. As a matter of fact, we are surprised at the number of people taking the prerequisite programs for the coming summer session which is the beginning of next year's program.

However, I think we need to do a great deal more in this area than we have done before. I think the library school programs are beginning to develop in this respect.

I want to direct a comment however at the people in the room who are not librarians and who come from academic institutions where they prepare people in the various subject disciplines. I have just returned from a tour of many of the colleges and universities here in the state of Washington, including two community colleges, with the idea of talking with faculty in the various subject areas. It is perhaps hard to believe, but the thought is still prevalent that you have to be a humanities bachelor in order to go into librarianship. No science people were advised to enter the program. Most of the time students will get their undergraduate degree without a modern foreign language because they have the high school two years requirement of entering college, so that we do have to work with the faculties who teach the undergraduate programs to do several things for us to provide the kinds of background we need for the librarianship. But most important, I think, is their help in directing people to us who are juniors and seniors who have subject disciplines in any field.

MR. COLLINS: I have been doing some recruiting with the high schools in Montana and haven't had very much success as far as the students were concerned, but I am getting teachers, and this is a very interesting fact. Of course, the main thing I try to emphasize is the pay. I show them the Library Journal and this large list of available jobs broken down to the various sections of the country so that they can pick any part of the country they want to go to. Most of them see this $5800 to $6000 to start and this impresses the students. But I found that it also impresses a lot of the teachers and so we had two this year who tried for one of the scholarships.

I think our biggest problem in the past has been that we haven't had contact with the school, the high school kids, to give them the idea that the library field is open to them. As far as the jobs are concerned there are indeed many.

MRS. STRICKLAND: I would like to make two comments on the development of science librarians. One, I feel this requiring of prerequisite undergraduate courses is beneficial on one side, but it does keep the science major from getting his fill of all the sciences that he needs. They are forced out. Second, some of my assistants have found your application form rather difficult to fill in.

They have to list the number of recent volumes they have read in the way of literature and so on, and I think to apply the same standards of admittance for a science major as for an English language major handicaps them.

Do you require all prospective science librarians to take literature selection sources, or social science references, or humanities, or could they have a choice?

DR. LIEBERMAN: In most of the library schools there are choices among the literature courses the student will be taking.

MR. ALLEN: I would like to ask you another question. Do you feel that it is absolutely essential for someone with a masters, say, in mathematics or information sciences to take the four prerequisite courses?

DR. LIEBERMAN: Well, the prerequisite courses were originally in the masters degree program. They have been moved down to the undergraduate level, which means that if you want an introduction to the general reference materials, or you want a basic foundation in the matter of organization of library materials, you will have missed that if you have a masters degree in a library field from an unaccredited school. If you have a masters degree in another field, you need the introduction to reference and to cataloging.

MR. ALLEN: This is what I am trying to develop, if I may just take a minute. I feel that you have widened this gap. I am wondering if psychologically he wants to go back to this undergraduate level and take these four courses. Couldn't you have extended it in another direction?

MISS KEENAN: Perhaps I might make a comment here. I wonder if it would be possible to take someone who has a masters degree in mathematics or engineering and put him into a library school, wouldn't it be also feasible to consider a synthesis of the undergraduate courses for this person's purpose in general information and perhaps bring this up to a graduate level course.

MISS EBERT: I would like to switch the subject to another need which I feel is very important in existing staff in upgrading their subject competence. I would like to address this question to you because the thought has entered my mind that I would like to have, for instance, specific members of the staff have an opportunity of going to a university and working, even as part of an in-service program, for instance, in your science or your biological laboratory. I am referring to library areas, where there is greater concentration in subject resources that we ought to know more about and haven't had access to.

Would you, as a university, be interested or willing to give that kind of a professional in-service training?

MR. ALLEN: Yes, we would.

MISS EBERT: Fine. We will send you some.

MISS DARLING: I think that would be very, very important.

MISS KEENAN: Don't we need to be considering continuing the education on a more extended basis for medical librarianship than what we are doing now? I think we have made a good start with our continuing education courses offered by the Medical Library Association. Don't we also need to be considering full university courses in subject areas?

MISS EBERT: Right.

MR. OPPENHEIMER: If such a program should take effect, would the University of Washington library staff have the time to take the in-service people in hand and teach them the things that they should know?

MISS DARLING: This is a real problem. If your staff isn't really behind the program, you are just sunk. You might as well not have it.

MR. OPPENHEIMER: They must be behind the program, but they may lack the opportunity.

MISS DARLING: If they are not able to get their job done, they are not going to be receptive to having trainees. You have to be careful that you have the support of the staff because they really can sabotage it.

MR. OPPENHEIMER: I am all for the program. I think it is a very good idea, and if the staff has the time, it should be made available.

MISS DARLING: Well, this means that the library's budget has to carry more people.

Q: Would someone with a masters degree in math want to develop librarianship? Perhaps we are talking about a different kind of degree or a different kind of training. A person who already has a masters degree could do graduate work. Is there a different kind of degree or program in the library school for this person?

Q: It would seem to me that a person who has a masters degree in mathematics would benefit everyone concerned to a greater degree if he would go into an information sciences program leading toward a doctorate.

MR. ALLEN: He can't practice, though. He can't practice the profession of librarianship.

Q: What about certification requirements?

MR. ALLEN: All right, if you will do that.

MISS REYNOLDS: You have a committee, refer your questions to the committee.

MR. ALLEN: So you may have noticed, these are little inside problems.

MISS DARLING: Well, we have two degrees in our library school. One is in information science and one is in librarianship. For the people you were talking about, there is a requirement for a certain amount of mathematics, a math major would be even more welcome than someone with a background in other sciences and languages. These people have a core curriculum in the library school and then they take information science courses that are being offered in engineering or business administration.

Q: That is my point exactly.

MISS REYNOLDS: Well, what is a librarian if he isn't in information?

MISS DARLING: But these people don't take all the administration courses, for instance.

MISS KEENAN: Isn't there also a need for someone with a background in biological chemistry, e.g., a real good reference librarian, not just an information specialist?

MISS DARLING: The people I have referred to take a score of courses in the library school, cataloging, reference one or two of the science bibliography courses, and some other courses. There only have been two people in it this year, one is a Ph.D. in physical chemistry and the other one has a masters in one of the biological sciences. We hope to have more next year, but it will naturally be low at the start.

Q: Well, will a Ph.D. be interested in $5600 or $6000 a year?

MISS DARLING: No, he probably won't work in a university.

Q: Then we are not going to be really filling the needs.

MR. ALLEN: The more you extend this program the more will you be in trouble, and it doesn't matter whether you extend it at the top or extend it at the bottom.

MISS REYNOLDS: Let's face the fact they are going out for $7200 in the East.

MISS DARLING: But there are jobs open all over for systems people in libraries now that pay $10-12,000 to start with, and if these people like the academic atmosphere, they will be quite happy to take jobs of this kind.

MR. COLLINS: When I spoke of $5800 to $6000 before, I had high school students in mind. When I was talking to the teachers, then I talked on a different level entirely. But each won a $7500 scholarship also.

MISS DARLING: I think a lot of these jobs now are comparable to faculty salaries, and so that if this is the kind of life you want, this would be more agreeable.

MISS EBERT: We haven't really addressed ourselves to the question of an information system relating to medical library service. Are we going to do that tomorrow?

MR. ALLEN: I believe that this will be taken up tomorrow in connection with Dr. Cummings' talk.

MISS HUGHES: Could I make one request? Mr. Fraser told us that the individual doctors in British Columbia assess themselves $25 a year. Do the physicians in other states provide any money toward the support of their libraries?

MISS REYNOLDS: No, though there is a distinct possibility that this is not being utilized. It could be, if the physicians thought they were going to get something for their money.

MR. ALLEN: The time has come for adjournment. We will reconvene tomorrow morning at 9:15.

ROLE OF THE NATIONAL LIBRARY OF MEDICINE

Dr. Martin M. Cummings

MR. MILCZEWSKI: We are getting to the last lap of this conference, or what appears to be the last lap, and I am glad to see everybody back again.

Dr. William Robertson, who is the Medical Director of the University Hospital, Associate Dean of the School of Medicine, and Associate Professor of Pediatrics, is with us this morning.

I would like to ask him to say a few words on behalf of the School of Medicine, which is co-sponsoring this conference.

DR. ROBERTSON: Let me say it's a pleasure, on behalf of the School of Medicine, its faculty and Dean Hogness, to welcome the guests and visitors to the University of Washington campus and be afforded the opportunity of participating with the library here in the sponsorship of this particular conference.

I am sure each of you will understand why the Dean isn't here today. He had planned to come, but today is the day he gets into the ring with the President to defend the budget of the Medical School for next year. He did extend his personal regrets at being unable to be here.

Crucial to the success of the medical schools are the library facilities on which it is founded. Crucial, also, to the success of the majority of the research programs are the library resources that are made available to the faculty members.

Certainly as our medical school is seeing itself, partly on its own initiative and partly in response to pressures from "The Great Society," our profile is changing very significantly. As this is happening, we are very cognizant of an increasing dependence upon library resources and library facilities.

Let me give you just one example about our change of mission. When we started back in the late 1940's, we had some 300 undergraduate students, about 30 interns, 40 residents and four so-called postdoctoral fellows. Less than twenty years have elapsed since that time and today we still have 300 undergraduates, but we have 70 interns. Instead of the 40 residents, we now have

300; and instead of the four postdoctoral fellows, there are working in the Health Sciences Division more than 380.

These people are particularly dependent upon the types of information and types of facilities, that we are talking about here. If this hasn't touched on the really significant change in the profile of medical schools with reference to continuing education of the physicians who are in practice, I would only make a plea to this particular group and other groups that might follow this. I think we as scientists working in medical schools, as scientists working in universities, have our foot in the door and will make sure that scientist-to-scientist communication stays at a peak level; that the facilities are made available to the biochemist, the microbiologist, the statistician.

Where I do see some possibility of a problem arising is in the transmission of information to the practitioner, to this particular person who is involved so basically in this continuing education. This is one of the things our medical school, and I think, medical schools around the country, are increasingly concerned with. And I just throw it into the hopper as one of the issues you already, I am sure, reflected on. I just want to support your consideration of this particular issue on behalf of the Medical School.

I would like to introduce our speaker of this morning, who has thought about this and a lot of other things before he's come to us.

Dr. Martin Cummings is a graduate of Duke University's School of Medicine. His background is in two fields, blending basic science, microbiology, with clinical medicine particularly in chest disease. He has worked with the Veterans Administration, with the National Institutes of Health; he has had appointments on the faculty of Emory University, George Washington University, and served as professor and chairman of the Department of Microbiology at the University of Oklahoma School of Medicine. He now serves as the Director of the National Library of Medicine. I think all of you have had a chance to meet him, and without further ado, it is a pleasure to introduce Dr. Martin Cummings.

DR. CUMMINGS: I was impressed yesterday in the small working sessions that many of the problems we have been examining regarding future program plannings, seem to have been solved very promptly. For example, I learned, as you did here yesterday, where our regional medical libraries are going to be located, and gained an insight into the size of the projects.

Now I hope these prognostications prove to be correct because we still have, I believe, a lot more work to do before we can clearly see how this integration of library and information service is to take place. There is no real argument that a revolution in the information requirements of our new medical community is taking place, and the reflections of Dr. Robertson about the change in image of this medical school in less than two decades is a very good reflection of the change that's taking place throughout the nation.

This year the Federal Government alone will support more than 17,000 new, separate research projects and the advanced training of some 25,000 scientists. These are people with the idea and the energies to be generating the information that will sooner or later come to us for processing and for distribution.

The President, last October, in signing the Medical Library Assistance Act of 1965 made a statement which I think was realistic. He said that "the creative process of knowledge expansion cannot go on unless the results of scientific work are available to practicing physicians and health workers across the country. The nation's medical libraries are a vital link between medical education and practice and research."

I believe the discussion yesterday afternoon reflected the need for some better understanding of these linkages. But we view the National Library of Medicine's responsibility in the national effort not just as an obligation to build bigger and more handsome libraries, but to build better systems to transmit information to those who need it. And the ultimate aim is to improve the health of the people of this nation.

We believe all medical libraries share this responsibility with us. As the nation's primary resource for accumulating, managing, and disseminating the world's output of medical literature, we are now buried under some 1,250,000 documents of one form or another, all of which relate to health. It's much, much easier to protect such a vast collection of information than it is to share it.

My remarks today will be concerned with the mechanism of sharing this vast collection of information.

Ten years ago when the National Library of Medicine was brought into the Public Health Service from the Department of Defense, it was the world's largest and perhaps greatest medical library. It was a major medical resource because physicians for a hundred years had insisted on keeping its physician leadership. My predecessor, Dr. Rogers, perhaps more than anyone else since John Shaw Billings concerned himself with the whys of new techniques for delivery of these informational materials.

Some of the Library's renovations, the introduction of wholesale rapid photocopy procedures, the introduction of the use of computers for indexing and cataloging output--I think will be viewed as rather premature by all of us in the next decade. So the concepts which I would like to share with you today, may to some in the field be considered old or traditional. To others they may seem to be radical, untested concepts.

The ultimate aim in the structure of the medical library information system or network, which I plan to discuss with you this morning is to get information to the most important participants at this meeting, men like Dr. Bowman, who came from Billings, an information user, or men like Dr. White, from Boise. All of you who view the schematics I will present, I hope will regard them from that viewpoint.

I am not going into detail about MEDLARS since most of you are familiar with the system. But I do want to say that MEDLARS is a reflection of the leadership that medicine has taken in information handling. Not many people realize that the MEDLARS program, really, has developed through grant from the Council on Library Resources and the National Institutes of Health to the National Library of Medicine. Somebody in the medical research community decided that they needed a more efficient system for reference retrieval. With those basic grants we developed MEDLARS and now have produced the computerized catalog, which I hope all of you are receiving. We hope this catalog will effect a real national economy through the elimination of duplicative cataloging.

Today an engineering group is advising the Library on how to convert this first generation of MEDLARS computers and replace it with a new system that will be faster and more powerful.

I mention this because many of the things that we describe today will be history tomorrow.

To plunge promptly into philosophic and policy considerations, I would like to read to you the recommendations of the President's Board of Regents. The recommendations are the result of about a year and a half of careful study by this group of physicians, scientists, and librarians who advise the National Library of Medicine.

They remind us that medical libraries historically have been structured in the free public library pattern, but because of increased demands and lack of support of local libraries in recent years, you have been forced to find ways to collect nickles and dimes for pages of information delivered.

The philosophy is to remove any obstacle from information flow--even obstacles as small as the need for ten-cents-a-page charges for Xerox copies.

I quote, "Access to the information in the National Library of Medicine should be available to all qualified users without charge as a public service." You've already paid for this, since NLM is a tax-supported institution. I want to remind you that this generosity on the part of the Regents is a generosity with your own tax funds.

Secondly, the Regents state that the National Library of Medicine's services should be viewed as part of the total responsibility of the Federal Government for the health of the people. I think it's quite clear that the Regents believe that the library resources should accompany other Federal resources, as they may relate to the nation's health.

Third, and this has pertinence to your consideration for regional library development, all cooperative service programs between the National Library of Medicine and other agencies, institutions, or organizations, should reflect these service policies. As such a natural resource, the Library can and should play a major role in supporting and improving both basic and continuing education in the health professions.

I think this is the first time in the 136 year history of NLM that the Regents have accepted the responsibility of directing the Library's resources towards solving problems of continuing medical education.

Figure 1 represents our current thinking with regard to the evolution of a biomedical library network.

We consider qualified eligible users as: any student of the health sciences, any scientist in the field, and importantly, any practitioner related to the health sciences.

The scheme is overwhelmingly simple. Mainly, the people who use information are usually those who generate it, so we have literature and other learning resources coming into the National Library of Medicine.

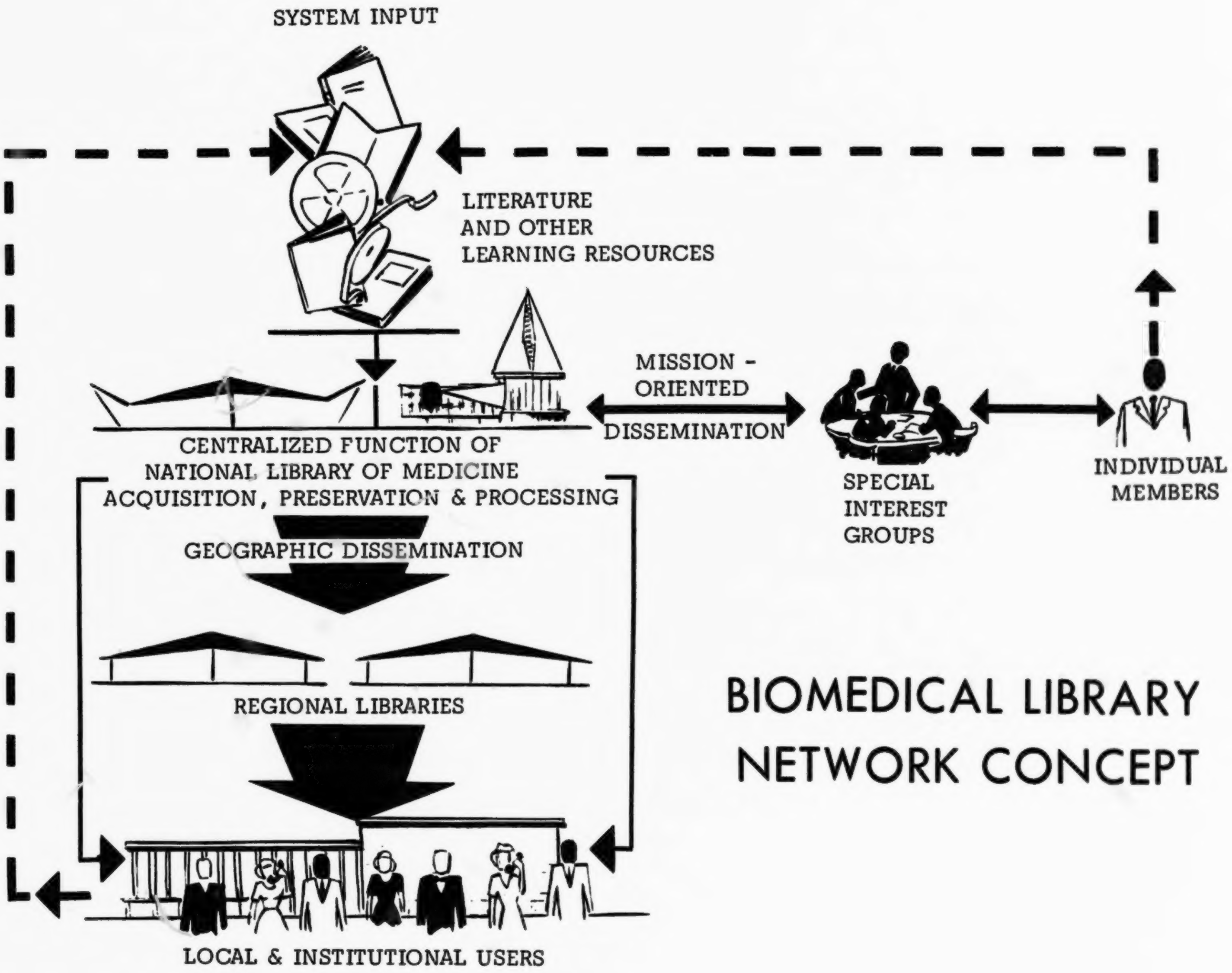
SYSTEM INPUT
LITERATURE AND OTHER LEARNING RESOURCES
MISSION - ORIENTED
DISSEMINATION
CENTRALIZED FUNCTION OF NATIONAL LIBRARY OF MEDICINE
ACQUISITION, PRESERVATION & PROCESSING
GEOGRAPHIC DISSEMINATION
REGIONAL LIBRARIES
LOCAL & INSTITUTIONAL USERS
SPECIAL INTEREST GROUPS
INDIVIDUAL MEMBERS
BIOMEDICAL LIBRARY NETWORK CONCEPT

Fig. 1 Biomedical Library Network Concept.

We believe libraries can no longer ignore the other substantive informational materials that are being made available, so anything that can be considered a learning resource will be acquired, preserved, and processed for transmission to a dual outlet of users.

To those who have specialized or mission-oriented interests, here is a lateral track which will provide the bibliographic information to professional groups who would use it in any way they require; for evaluation, for synthesis, re-synthesis, and for delivery to their own members.

We don't think it's essential that the library will be the only distributors of these materials, so this represents, as we will come to in discussion later, our views of how libraries and specialized information centers work together.

The massive flow of information through the vertical tract reflects the introduction of a series of regional libraries which will be large information stores to backstop the nation's 6,000 local medical libraries.

As someone said yesterday, this will relieve the National Library of Medicine of the burden of being the exclusive backstop of all local libraries, but that's not the sole purpose of this scheme. This design is not to relieve the National Library of Medicine of the burden. The purpose is to get information resources closer to the user; fore-shorten the time required to get material from Bethesda to Seattle, for example.

There are other purposes that I will describe in a few moments.

In the next chart (Fig. 2) I return to a philosophic consideration.

My view is that no system should be monolithic unless it's economically sound to be monolithic.

We have examined quite carefully all of the existing functions taking place in the National Library of Medicine and have decided that it is economically sound to have one place in the United States (NLM) responsible for the preservation of the world's biomedical literature. We believe it is economically sound to process bibliographically all of these materials rather than having hundreds of repetitive and duplicative indices and catalogs of the same material.

Therefore, it is intended that these functions will remain in the National Library of Medicine.

But new dimensions have been added to our centralized processing function; namely, we now replicate by film the high quality, high-yield portion of our collection, in full text, so they may be shared. We have begun to collect and process other learning resources such as audio-visual materials so that at one place in the nation one can have ready access to this store of information.

These materials then will be delivered to regional and local users for their use when requested.

With the next chart (Fig. 3) I introduce a mechanism which I hope will meet some of the problems which were raised in the discussion yesterday afternoon, that is, that somewhere in the nation there be a center for biomedical communication which has a multi-purpose function.

By law, this center, when it's constructed, must serve as a regional library. This part of the center for biomedical communications will reflect

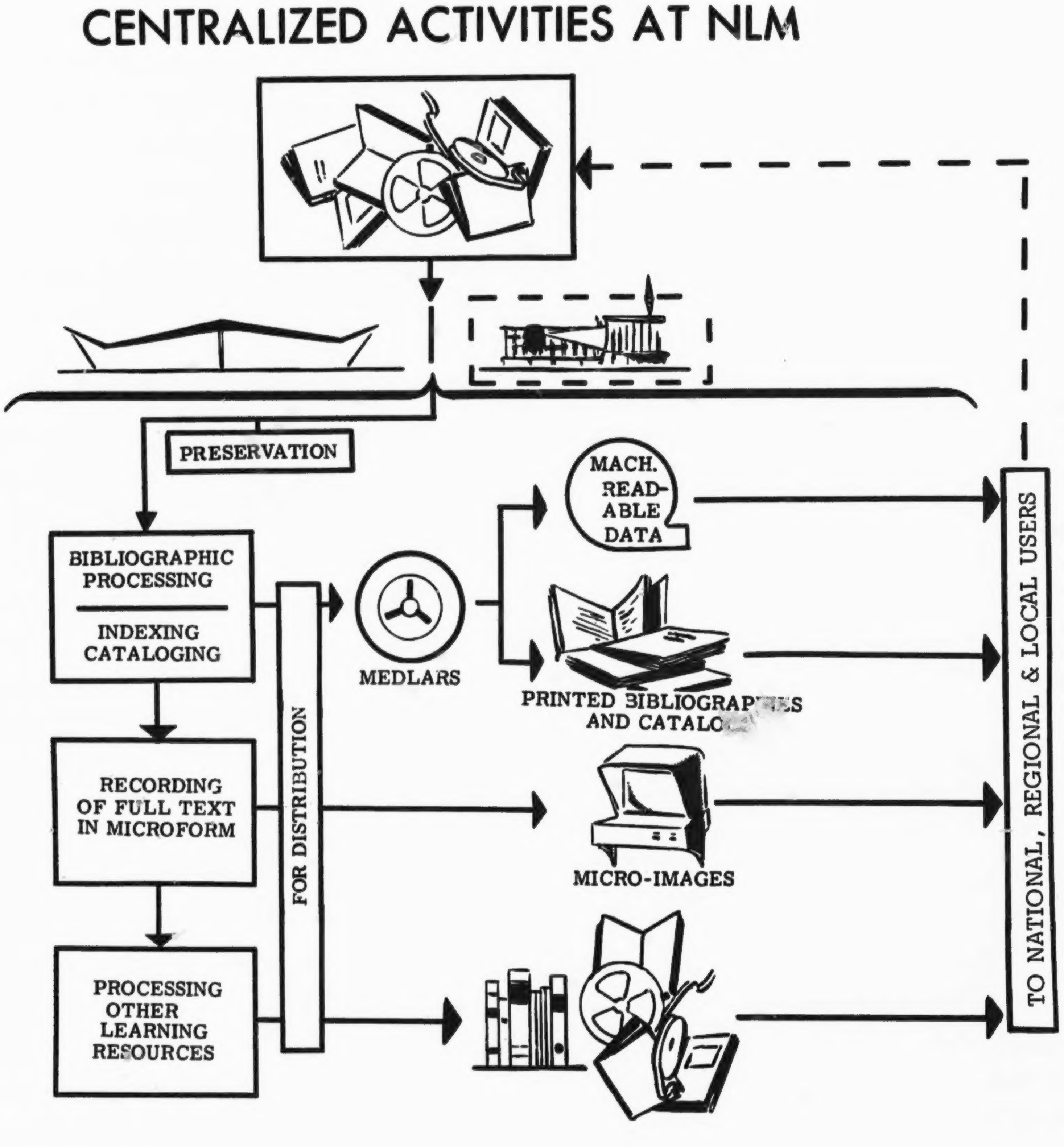
CENTRALIZED ACTIVITIES AT NLM
PRESERVATION
BIBLIOGRAPHIC PROCESSING
INDEXING CATALOGING
RECORDING OF FULL TEXT IN MICROFORM
PROCESSING OTHER LEARNING RESOURCES
FOR DISTRIBUTION
MEDLARS
MACH. READABLE DATA
PRINTED BIBLIOGRAPHIES AND CATALOGS
MICRO-IMAGES
TO NATIONAL, REGIONAL & LOCAL USERS

Fig. 2 Centralized Activities at NIM.

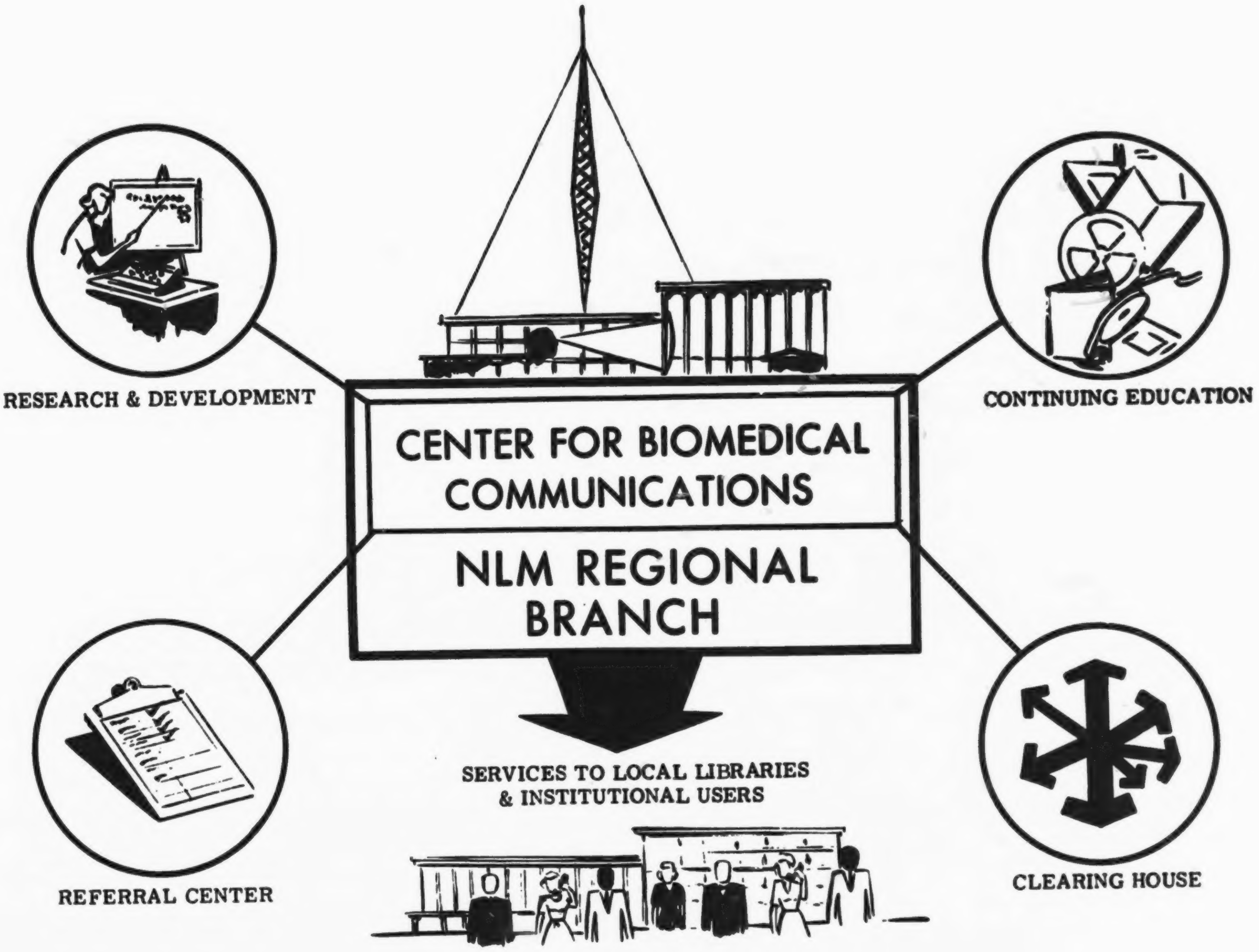
RESEARCH & DEVELOPMENT
CONTINUING EDUCATION
CENTER FOR BIOMEDICAL COMMUNICATIONS
NLM REGIONAL BRANCH
SERVICES TO LOCAL LIBRARIES & INSTITUTIONAL USERS
REFERRAL CENTER
CLEARING HOUSE

Fig. 3 Center for Biomedical Communications.

the same kind of service that a regional library at the University in Seattle might provide. We believe that this center should also serve as a National Referral Center.

Take some of the examples brought up yesterday; if you need to know the location of every Poison Information Center in the United States, you should be able to dial one place. You may not get all of the data on poison information, but you will have assurance that you will be referred to a certified data bank. The center for biomedical communication will also serve as a clearinghouse for the non-formal publications, such as the expanding technical report literature. These materials will be indexed, cataloged, although they will not be handled in the same form as books and journals.

We believe also that the center of biomedical communication should serve as the communications research and development arm of the Public Health Service. It would have an intramural activity much as the NIH serves the health sciences. Finally, we believe that it should serve as a prototype or model for studies of continuing education in the health sciences. This facility would be available to all groups who have ideas to be tested and who need the expensive hardware that is required in some of these experiments.

Computer simulation studies, and similar experimentation can be performed in this center by visiting scientists. We believe that there is an urgent need for such communication facility in this nation if for no other reason than to avoid the fractionization of information which is taking place at a rapid rate today.

I don't want to convey the impression that what I have shown you so far represents a systems design. It obviously doesn't. It is a concept. We are now making measurements of such things as operational costs and of the administrative requirements for managing such a system.

We are, with the help of industry, making alternative plans that would give us a fix on through-put times. We are getting guidance from industry on transmission quality requirements, because it would be futile to have linkages if a physician or scientist at the other end just won't listen or view the retrieval transmitted. Finally, we are asking industry to help us with the costing out of linkages between the National Library of Medicine regional centers and local institutions.

We view the basic philosophy behind regional service as a very simple one; its aim should be to provide equal and rapid access to this body of information.

We believe that the specialized information center should not replicate library resources but should reinforce them. I have very serious concerns about the high cost of running specialized information centers for small user groups, particularly for local user groups. They should be nationally asserted.

We have estimated that if you take all of the major disease categories of medicine and multiply these by the number of dollars now spent for the management of one specialized information center, it will cost eight billion dollars to cover the totality of medicine. This is obviously ridiculous. One could probably reduplicate all of the research for the same amount of money. So there has to be some kind of an understanding of how libraries provide basic support to specialized information centers and how specialized information centers provide national services to large user groups.

You can justify spending a million dollars in support of a disease-oriented information center if it is going to serve the entire nation. I don't believe you can justify doing this only to serve the interests of 14 or so members of one department or even of one institution.

The importance of the local library must not be lost in this concept. Our attitude with respect to local libraries is reflected in the Medical Library Assistance Act. We fully expect to have more money to invest in upgrading the nation's local libraries than we will invest in a modest number of regional libraries to be established.

A recent study by Herner & Company,[1] made at the request of the Bureau of the Budget, I think has some profound potential effects on groups such as this. I don't know how many of you have yet had an opportunity to see this.

It's clear to me that the study had some effect on Miss Keenan, who reflected yesterday some of the views by this study.

I want to say that I think it's a poor study. It makes projections which I believe would be wasteful of federal funds and critical manpower. I think the library community is betrayed by the projection of funds that would be made available to you, but more importantly, I think the health community is betrayed by some of the concepts which are introduced.

In essence, the Herner Report calls for the establishment of interlibrary loan repositories and district libraries to take the place of existing local libraries. These units would relate to each other under strict federal controls. It calls for the expenditure of about ten million dollars for "detail men" to bring information to physicians much as drug detail men now deliver information to them.

I make a clear distinction between this and the kind of field representative we talked about yesterday, which is so adequately serving British Columbia. Further, Herner calls for an array of services, which I believe do not reflect the needs of medical educators, researchers or medical practitioners.

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[1] Herner and Co., A recommended design for the United States Medical Library and Information System, 1966, 2 vol. (Unpublished)

Libraries share the blame for this confusing study because some of you participated in it.

Only one physician is listed as a contributor to that study. I have talked with him and he admits that he had a ten-minute interview with this group. I am making the point that these 90-day crash studies can completely have the effect of throwing orderly programming into the ashcan. Personally I am terribly disappointed to learn that the medical library community allows itself to be "used" in this way.

The final remarks that I want to make relate to how libraries may serve special-interest groups. I have in mind here the very important social developments through the heart, cancer, and stroke regional program.

I believe that libraries should offer themselves aggressively as a part of the communications matrix for these regional health programs.

We are doing just this at the national level with Dr. Marsten and his group at NIH.

We made unusual efforts to learn about the planning of these regional health programs to determine what kind of information requirements they will have and to enable us to begin to generate specialized bibliographies, specialized collections, specialized services, to fit their needs. We should not expect these programs to be satisfied with our traditional service. We cannot expect these people to be able to fit into normal library schedules. We should begin to determine their needs, for example we should find out such things as whether they would rather have local libraries closed in the daytime and open at night. Now this may sound a little ridiculous to you, but I have a feeling that this is what the users really want us to do. We must re-examine our way of doing business.

The National Library of Medicine has begun to make special packages of information for these people. Those who will be concerned with heart, cancer, and stroke don't want to plow through the unrelated literature. We must begin to deliver at least, a first cut of relevant materials. I must add that anyone concerned with local or regional or even national planning, has to be aware of the fact that medicine is a part of society, medical libraries are part of a larger library community; ultimately a national information system of one type or another will emerge and we must be prepared to be compatible with it.

We have a paradoxical situation, since medicine actually is in the forefront in operating information experience, and is developing an active network, the national system may have to conform to a subsystem. But I don't think anyone can fault us for trying to meet urgent needs now.

With respect to some of the conversations yesterday, I want to emphasize that medical librarianship involves not only the needs of the immediate consumers but responsiveness to the society which invented libraries. I think we have to examine the effects, for example, which cybernetics has had on language and on information broadly, and be aware of how this will impinge on our medical developments.

The next four or five years will undoubtedly bring you the resources that you have desperately needed for many years. In closing, I would like to say I am convinced that we must discard the notion that because we have been doing something one way for a long time it is sufficient justification to resist change.

If we are willing to change, and change in a way which medicine accepts, the library will become the active information center for the health sciences.

Thank you.

MR. MILCZEWSKI: Thank you, Dr. Cummings.

Are there any questions that you would like to raise at this point?

MISS KEENAN: I wonder if I could make one statement on the Herner & Company report? I would like to say publicly I saw this report for the first time last week. I, also, was very unhappy with it. I was most unhappy however with the fact that several of us have our names attached to this report without our permission. Some of us have written to Herner & Company and stated that we did not approve of their technique and method and slipshod preparation, and that we wished to withdraw from it. I noticed this was completely ignored. In fact, I have been seriously considering even for myself on publishing a statement that I do not associate with it.

MR. MILCZEWSKI: This brings to mind a question for Dr. Cummings. Miss Keenan has written the company. Should she have sent a copy of the letter to the Bureau of the Budget or to somebody in particular at the Bureau?

DR. CUMMINGS: I think that might have been useful.

MR. MILCZEWSKI: But just to the Bureau of the Budget without mentioning any special agency within the bureau?

DR. CUMMINGS: It would have filtered down to the appropriate office.

MR. MILCZEWSKI: The suggestion is that a copy of any such letters go to the Bureau of the Budget because it was at the request of the Bureau of the Budget that the study was made.

MISS DARLING: These people who conduct such information studies and surveys always come at the request of an over-all sponsorship of a government agency. We have had, I don't know how many, people in the National Science Foundation come to make surveys of one kind or another. It is difficult to call these people after the fact and talk to them. You really have no control over what they do after the data have been collected. They come to see what you are doing and ask for annual reports and it seems to me the sponsoring agency has a responsibility in this connection. They are the ones that are paying these people to do these surveys.

MISS ANNAN: Since I am one of those mentioned in the Herner study, I think I can say that the librarians were more outraged than the staff at the National Library of Medicine and I think the comments sent in by the librarians were extremely critical and quite resentful.

I have seen a couple of them, as well as my own, and I agree with Louise on the National Science Foundation. I can't help but wonder what they have to do with their money because they are certainly flooding us with these time-wasting interviews and very inept questionnaires. They are unintelligible and I have the same feeling that if this is a serious study, we should be serious about it.

But in December I wrote for more information regarding this study and I didn't get an answer for about five months, so I felt they were not very serious about it. I would like to ask Dr. Cummings what should we do?

DR. CUMMINGS: I can understand how, when you are approached by a contractor who announces that he is doing a study for the federal government you feel the obligation to be responsive and to share information with him.

If I were in such a situation, I would insist on seeing a preliminary report before I allowed my name to appear on the document.

I said something yesterday about information science being more a political science than a true science and I am convinced that is part of the problem.

The Herner study was made originally to find out whether there really is a need for funds to upgrade the nation's medical libraries and to determine whether there was a need for funds for construction of new medical libraries.

The report says there is no need for construction money for medical libraries for the next five years.

I think now you have an obligation to carefully read the report and to respond to it as it affects the medical community.

I am more troubled, I suppose, by the lack of understanding of the needs than I am of the distortion of library requirements here. The report in essence says that doctors and medical scientists don't use the medical literature. Well, I don't believe this. And I don't think you believe it either.

I am hoping that the responsible leaders of medicine, those in practice, those in the field of medical education, and those concerned with medical research, will examine the report to let their views be known.

Q: Dr. Cummings, can't this actually be turned into an advantage now that it has happened? If everybody who responded to the questionnaire reads the report, particularly those whose names appear in it, and writes directly to the Bureau of the Budget of what things he disliked about it, sending copies of these letters to his congressmen, it could, in effect, be a force for considerable support.

DR. CUMMINGS: I think that's a possibility.

Q: That brings up a point that there should be integration and coordination between the libraries on a state, national, and even international scale.

Does the National Library of Medicine have a broader international cooperation in making more effective contact with institutions of tropical medicine in Southeastern Asia, e.g.? Can this be expanded perhaps with the help of UNESCO or WHO, into an international integrated network?

DR. CUMMINGS: I think the answer to that is yes. There can be such international cooperation and I think you have identified at least one of the appropriate international organizations which should have a principal concern with such a development. But I think the facts of life are that the subsystems develop and become operational before the full systems evolve and I would hate to wait, for example, for UNESCO or WHO to solve our library problems.

We have an obligation to solve our national problem and then offer it as a working model to an international organization to explore and expand and refine it for international information needs.

Q: Could you explain your remarks on the development of technical reports in your collections? What service do you anticipate giving?

Many people who should be interested in this do not have access to TAB if they do not have contracts with the government.

DR. CUMMINGS: Yes, that statement is correct. I have been particularly interested in the life sciences literature that relates to results from work sponsored by NASA, the Atomic Energy Commission, among others.

At the moment these medical reports are sorted into two piles, classified and unclassified.

The unclassified literature or technical report literature has been placed in the Federal Clearinghouse.

In the past year we decided that there were sufficient high quality foreign language translations of medical literature to produce a bibliography of medical translation as one way to tell you what is in the clearinghouse. However, we still receive many requests for translations of foreign literature from people not knowing about the clearinghouse. The question we raise about this technical report literature, should we turn these materials over to the Federal Clearinghouse or assume the responsibility for maintaining the indexing of it and provide it to medical users as we do published works? It is not a massive portion of literature. Our estimation is that it represents less than 10 per cent of the total medical literature. I think most scientists here would not rest with allowing their best work to appear as a technical report. The cream of this material is ultimately published and you will find the same material in the published literature. Some of it either doesn't pass the test of editorial review or never is submitted for editorial review and thus may never see the light of day.

MR. MILCZEWSKI: Dr. Cummings, yesterday there were a number of questions from doctors in the audience regarding our needs. There was one question particularly about the immediate need for information, as well as for information that did not require such immediacy but greater depth.

I would like to hear your thoughts about how these kinds of problems may be met. My second question is whether there are any studies underway on the needs of users of medical library services.

DR. CUMMINGS: I would like to respond to the second question first. There have been several studies which were concerned with user needs. I think that most people who have examined these studies are not prepared to accept the findings for one reason or another. I believe an honest answer to your question is that to my knowledge there is not a total comprehensive survey which adequately reflects user needs.

User needs may be different in different communities. I would hope that if there is a genuine interest in the development of a regional resource for the Pacific Northwest, part of the planning would include such a study. It is quite clear that user needs in a rural area are much different than user needs in a dense urban area.

With respect to your first question, I believe that librarians should not be expected to deal with questions such as one that was brought up yesterday, relating to the latest therapeutic regimen for the treatment of, say, chronic leukemia. These are, I think, information questions which are unfair as posed to medical librarians. I share the view given yesterday that there are other information resources, usually an individual with experience or competence. I think it is pretty darned hard to beat the telephone in order to get that kind of technical, precise information needed in a hurry.

The concept that somewhere in the nation there be an address and referral system, I think, meets a second order of need: Where can I go to get some kind of specialized information that I need, not today, but which I might need in the next few days? And here I am convinced that a physician or scientist should be able to dial directly a referral center where he would be told that there is a Parkinson's Disease Information Center at Columbia doing brain research, or that they do specialized information work at the Diabetes Information Center in Minneapolis, and so forth.

There are, of course, numerous other channels of information exchange. I think the Associate Dean referred to scientist-to-scientist communication. I don't like that because it refers only to scientists' communication, and there is a need for scientist-to-practitioner communication, educator-to-scientist, etc. It would seem to me important that within the context of regional medical programs libraries provide you with current awareness literature services. This is something I know libraries can do.

If you tell the library in advance the profile of your interest, I think they can aggressively program to provide this to you on a regular basis. Dr. Rogers is doing this for forty faculty members very successfully at the University of Colorado. This could be done for four hundred or any reasonable number. I think users are willing to come to a library and tell the librarian what they are interested in.

A librarian just can't keep up with your interests unless you share them. I am a great believer in so-called selected dissemination of information.

I know there is a concern that a computer will divorce the user from information. I just don't believe that at all.

I view the computer in the same way as the stethoscope. It allows you to see or hear or read something that you couldn't do before because you didn't know it existed. So I don't think that literature searches by computers are going to drive you away from the science literature. I think it is another bridge to bring you together with it.

Q: Would you elaborate a moment on the current awareness program?

DR. CUMMINGS: The current awareness service essentially is established by a system of what I would call small recurring bibliographies. Instead of challenging the data bank ad hoc, you program a recurring set of questions so that, for example, if your interests happen to be chemotherapy of leukemia, you inform the system in advance that you would like to be notified every time a new article appears with that subject. On a weekly or semi-weekly or monthly basis you get a print-out of the citations and a very brief telegraphic documentation of the major concepts contained within the article. Then you merely scan this to decide whether you want it in full text. This is a very economic and practical information transfer mechanism.

Q: Dr. Cummings, what role might facsimile reproduction by wire have in the scheme you have been discussing?

DR. CUMMINGS: If you are talking about Xerox transmission by wire, we have examined that and determined it is currently too expensive for extensive use. We have chosen to begin instead to copy the most important part of our collection. We have contracts with University Microfilms, to prepare 35 millimeter roll film, twelve to one reduction, of what we think is the best 10 per cent of our collection. We intend to share this with regional libraries.

This is the route we are taking because of economic considerations. Later these films may be converted to microfiche.

We are having a million pages copied now for less than $33,000 and we will have second and third and fourth generation copies made to share with these regional libraries. I know of no existing economically sound way to transmit full text by wire. Other people may have some insights that I don't enjoy.

I would like to show two slides to elaborate this concept and which may give you an insight into these bibliographic and mission-oriented modes of distributing information.

These represent the forms of information that we intend to package and provide to regional libraries (Fig. 4). Obviously, books and journals still

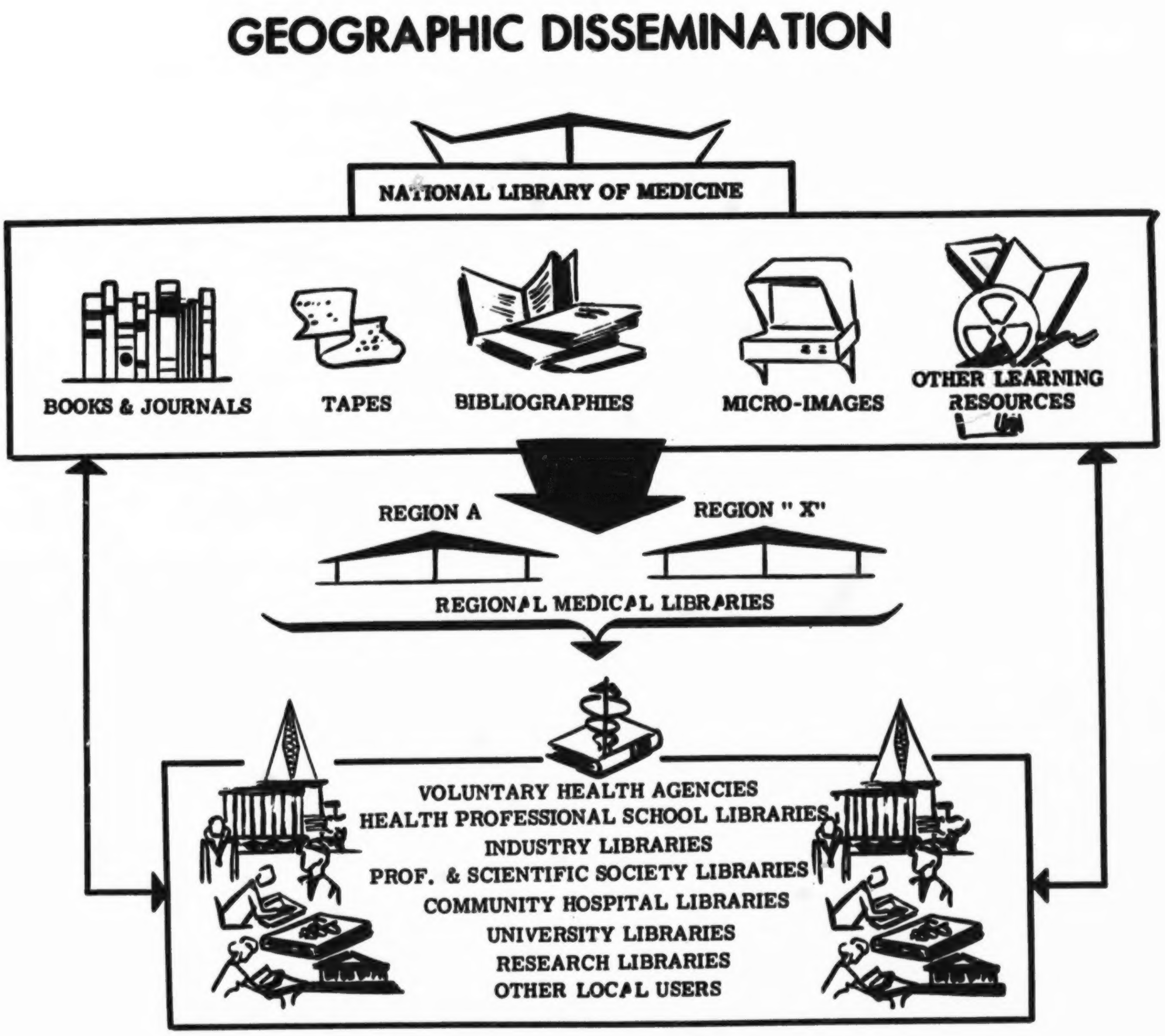
GEOGRAPHIC DISSEMINATION
NATIONAL LIBRARY OF MEDICINE
BOOKS & JOURNALS
TAPES
BIBLIOGRAPHIES
MICRO-IMAGES
OTHER LEARNING RESOURCES
REGION A
REGION " X"
REGIONAL MEDICAL LIBRARIES
VOLUNTARY HEALTH AGENCIES
HEALTH PROFESSIONAL SCHOOL LIBRARIES
INDUSTRY LIBRARIES
PROF. & SCIENTIFIC SOCIETY LIBRARIES
COMMUNITY HOSPITAL LIBRARIES
UNIVERSITY LIBRARIES
RESEARCH LIBRARIES
OTHER LOCAL USERS

Fig. 4 Geographic Dissemination.

are primary information sources but now we have machine readable information on tapes, be they paper, magnetic or otherwise. There are, of course, valuable bibliographies. As I have just reported to you we are microfilming the collection and are now beginning to acquire other learning resources that we will package and place in your libraries in an effort to democratize audio-visual materials in the same way libraries democratized books and journals.

The regional libraries will probably represent the best 10 per cent of this repository and shown below are the groups that we have identified as the principal user groups.

The next slide (Fig. 5) depicts the flow of information to specialized information centers. Computer tapes and specialized recurring bibliographies are produced by NLM for use by Federal agencies and public or private professional groups.

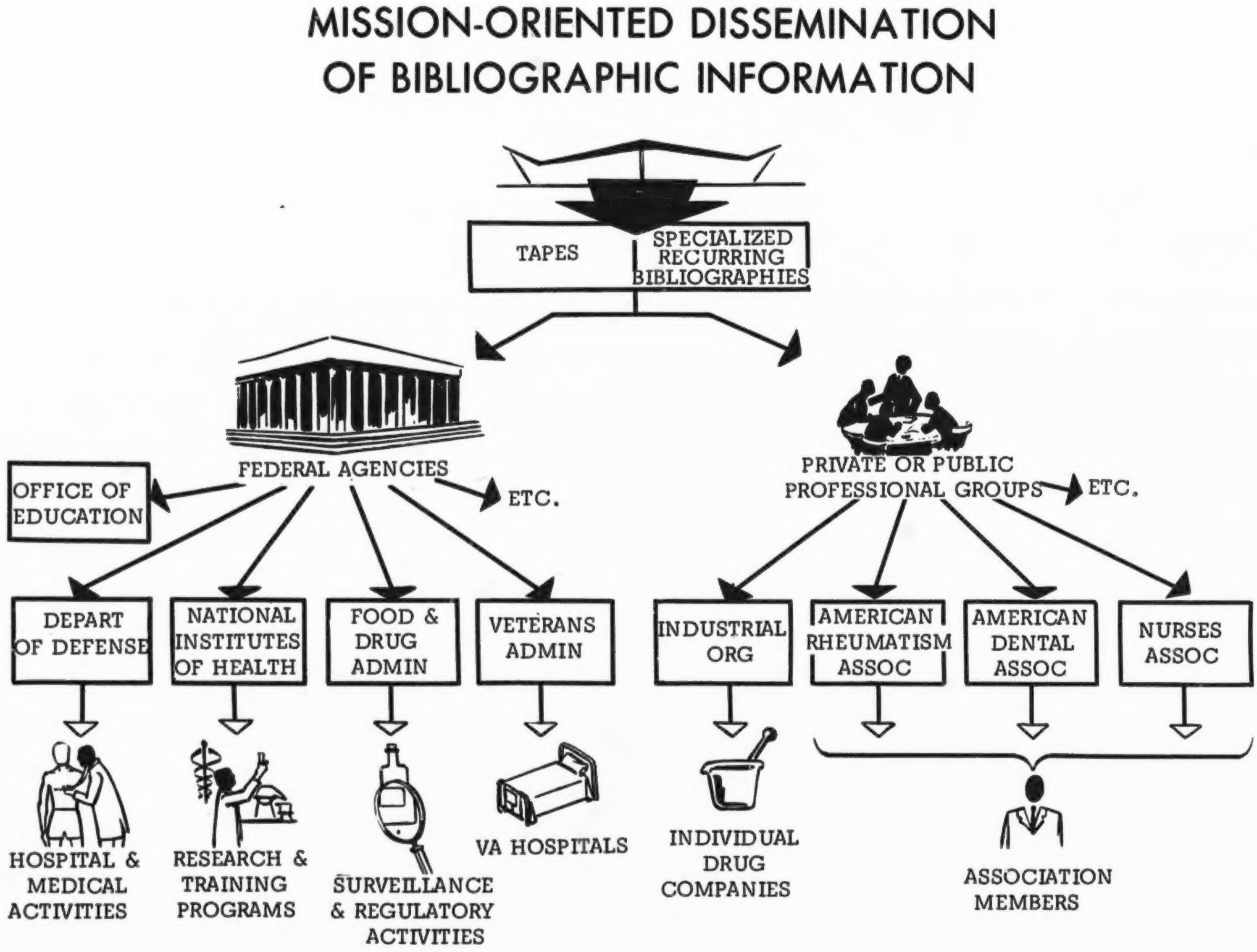
MISSION-ORIENTED DISSEMINATION
OF BIBLIOGRAPHIC INFORMATION
TAPES
SPECIALIZED RECURRING BIBLIOGRAPHIES
FEDERAL AGENCIES
OFFICE OF EDUCATION
ETC.
PRIVATE OR PUBLIC PROFESSIONAL GROUPS
ETC.
DEPART OF DEFENSE
NATIONAL INSTITUTES OF HEALTH
FOOD & DRUG ADMIN
VETERANS ADMIN
INDUSTRIAL ORG
AMERICAN RHEUMATISM ASSOC
AMERICAN DENTAL ASSOC
NURSES ASSOC
HOSPITAL & MEDICAL ACTIVITIES
RESEARCH & TRAINING PROGRAMS
SURVEILLANCE & REGULATORY ACTIVITIES
VA HOSPITALS
INDIVIDUAL DRUG COMPANIES
ASSOCIATION MEMBERS

Fig. 5 Mission-Oriented Dissemination.

The Federal agencies have their own community of users such as the hospitals of the Veterans Administration, the surveillance and regulatory programs of the Food and Drug Administration and the research and training programs of the National Institutes of Health.

Specialized recurring bibliographies produced by MEDLARS are published periodically by professional organizations for wider distribution to their memberships. Examples of these are the American Rheumatology Group which now provides its members with a current awareness index, using output from NLM to share with its members; the American Dental Association I think has also been extremely forward-looking in providing the MEDLARS generated Index to Dental Literature to its members, and the drug industry has on-going successful programs; the nurses groups are doing the same thing.

I believe that is all I wanted to show.

MR. MILCZEWSKI: We may, indeed, have come to the point where we can talk about what we want to do in the region and if it is possible for us to do so.

I told you yesterday when I made an introductory statement that this particular conference was a long time in coming. We had planned it and couldn't get it off the ground as quickly as we wanted to. Perhaps it was just as well it was delayed until now. No one will ever know, but in any event, we have met together and a good many things of significance, as far as I am concerned, have come out of this.

The University of Washington itself has assumed a regional responsibility for a long time. I think the library itself has been involved in regional activities in some significant ways for many years. We continue to be concerned about what the library responsibility is, what its response should be in the region.

I keep bringing this subject up in a variety of ways, in budget presentations and annual reports to the President, and in discussions around the campus. It is difficult for a university like this, a State university, to assume such responsibilities in any significant way with the kinds of support it can normally provide. This group has raised some questions that we either didn't raise in our original program, or have been rephrased somewhat.

It seems quite clear to me, and it probably is to you, perhaps in a somewhat different way, that we really don't know what our region is as far as medical library service is concerned. It is quite certain that we really needed to find this out. So far we have been operating together pretty much on the basis that the region is coextensive with that of the Pacific Northwest Library Association. This may be the best way for us to work, but it will depend, it seems to me, on some other factors which were also brought up.

Who are the present and potential users of the kinds of services that we see as being required? A good deal has been said about this. Dr. Bowman's name has been used quite often as an important kind of user that we need to serve. Now there are, I am sure, not many Dr. Bowmans, but there are others who have similar needs.

We are not sure, as far as I can discover, what the doctor, or the medical practitioner, or the person in health sciences, really needs, what he wants, and what he will use, and we are not sure how to get it to that person.

We have been getting information to these people through a variety of means. We make some assumptions as to who should be provided service. The Washington State Library has taken on some responsibilities for service for state institutional library needs. How do these relate to some other kind of needs that we see as being important in the region?

The state libraries in this region have close connections with the public libraries and these connections have been affected most recently, of course, by the passage of the Library Assistance Act. This is an existing network which perhaps should be used. We know some of the resources that are available to us. The Pacific Northwest Library Association study under Dr. Kroll presented some information which is, incidentally, now out of date.

Some of the states, Washington, for example, are taking another look at the resources available in terms of existing libraries and what resources are available on a number of levels, but these inquiries probably will not delve into the specialized area of service to medicine. It seems to me that we have a big task ahead of us and the question is, "How do we go about it?"

MISS REYNOLDS: I have been thinking that what we should be doing is to go on record that we want a regional medical library, that we want to be part of it, but since we don't know exactly what the region should be and what is needed in order to handle the service nor whom we need to be serving, we should be organized to get a request into the National Library of Medicine for some way to find these things out. What we need is someone who is assigned the responsibility to carry on with this draft proposal. Now if you want a motion, I would be glad to make a motion.

MR. MILCZEWSKI: I don't think this group needs a motion. I think we need a common understanding of the direction in which we think we should go. Does anyone want to comment on Miss Reynold's suggestion?

MISS REYNOLDS: Is there anybody opposed to such an action?

MR. MILCZEWSKI: I know this comes without any preparation on the part of the group, and you may want to expand on this a little more to give people a chance to speak to a particular aspect of this. What do you see in detail?

MISS REYNOLDS: In your remarks you covered some of the things that we need to find out, and what I was trying to do is to get some way to find out what the State Library should be doing. Dr. Cummings said that this should be part of an over-all planning procedure. I am perfectly willing it should be because right now we are in the process of developing a definite but very limited aspect of medical library service. We are serving the Health Department at the state level, and we are trying to do so adequately. The public institutional program has all kinds of needs in this area. There are other agencies of state government that overlap this, seen from our responsibility to agencies of state government, which are now scattered throughout the State, it seems to me we should be fitting into this planning so what we are going to be spending in the end will strengthen such a system and we, in turn, will be strengthened by what is developing. Certainly it seems to me there is a real possibility that we could get the public libraries into the picture in terms of service to the local physicians, which would then channel back through our normal, already existing, cooperative measures, which will thereby be broadened and strengthened.

MR. MILCZEWSKI: Does anyone have a comment?

Q: We don't know yet the priorities that should be established. Some of the things Miss Reynolds is talking about are different from the channels that have been established and which we wish to investigate at the moment. One of the studies then I think should be one devoted to the determination of priorities in establishing any kind of a network.

Q: I would like to raise the question that if the University of Washington were to assume the responsibility of carrying this thing forward, it will perhaps need suggestions as to who should be working most directly with the University.

MR. MILCZEWSKI: It seems to me that if we were to carry this on, we would need to be referring back to representatives of this group.

Q: Does the University of Washington and the medical school and does the State of Washington consider that these resources may be made available and that they have a responsibility in the widest concept of their use outside of the clientele you are charged to serve?

MR. MILCZEWSKI: I believe the University would be willing to assume this. It already does this up to a point. We make our resources available in a variety of ways, not only in the health sciences but in other areas as well, either through direct loan, interlibrary loan, or through a very active photocopy service. These are important, but they are not extensive enough to do what appears necessary to be done.

If this institution or any other were to go beyond this, it would have to have some resources outside of state-generated funds because the State of Washington does not take responsibility for the region, and I think this is precisely what the regional medical library grant program is intended to do.

Q: I would like to suggest or inquire as to the possibility of carrying on with a committee set up as was that for the PNLA survey, that is, representatives from each state and province forming a committee to really survey in the different areas and then present suggestions or make further arrangements?

MR. MILCZEWSKI: I suspect this could be done. We are operating in a somewhat different situation than we were at the time of the PNLA survey because PNLA took the initiative in this.

I think if the University were to take the initiative, it would still want to operate pretty much on the same basis to make sure it had representation and was reflecting the needs of the several states and had the cooperation of the people in the area.

Q: I don't think that the regional center should have the responsibility of deciding what the needs are. I think they should be able to satisfy the ultimate needs to take care of anything that may come up and that the various other libraries should then be familiar with what their position is. For example, Miss Reynolds would be more familiar with the kind of material the various development of state government institutions would need, and would always be able to get additional information. Medical societies would, of course, cater to entirely different needs and the university, of course, again would have different needs. Public libraries, for example, could take care of lay needs and I think in all of this we can't overlook the need for experienced librarians because this is, of course, still the most costly item, but we can limit material and space by having regional centers like this.

MR. MILCZEWSKI: I didn't mean to suggest that out of this would come some synthetic system, but one which would recognize the roles that the existing agencies should and might play, what support would be needed in terms of a regional center or in additional support for the agencies that already exist to do the jobs they should be doing. I think we need to know a great deal more than we seem to know now, or at least each of you may know it, but it hasn't been put together.

Q: Is it economic to have various groups like the State Library lending institution? I know we get inquiries from the state agencies directly which would get the material faster, perhaps by as much as a week, if there weren't these small locations to which they go first from where they have to be sent on.

Q: I think it would only appear that way because the big problem still is getting personnel and help.

I know from experience that the University, for example, could not provide the assistance that you can get at a local level. After all, this is what is going to make the libraries more usable, the accessibility and the assistance you can get in knowing what materials can be obtained and how quickly, and where something we need may be immediately available.

MR. MILCZEWSKI: Are there other comments?

DR. CHRISTENSON: It seems to me that there are some things which are not clearly defined, one, what is a region, and two, what will this regional library do for us as a region? We are represented here geographically, I think regionally.

As the lawyer says, "Anyone can sue." I think anyone can make a grant request, and in this state it doesn't take a motion, it takes only one person to write in, and I am sure Dr. Cummings has experts who can fill a wastebasket with them. I think whether it is the University of Oregon, Washington, or some library in Alaska, or perhaps the one at Eugene, which might eventually make a request, is beside the point.

I think it deserves certainly more than one approach because I don't think that we can sit down, or any group of us, and write what is going to be a particularly happy solution to this problem. Anyway, I don't think it is something like jumping off the boat and saying, "This is it, let's swim," without getting a lot of wrong people wet. I don't think that this particular body has any obligation to anyone.

I think we have learned a lot and I think it's in the hands of anyone who seems inclined, who wants to engineer this. I think it's fine if the university wants to, and if we in Oregon want to compete with you, that's our business, but I think this has been a learning experience for us and this is all it should be intended for.

MR. MILCZEWSKI: I heartily agree with you that this has been a learning experience. I think we need to continue with this and I would hope we would be able to bring this or a similar group together, at another time at another stage of development because I know this isn't going to blossom overnight.

Q: I think it is misleading when I say that I think the university should exercise leadership in this. This was the future planning group which would come up. I don't know what the reaction of the National Library of Medicine is, but I would think they would want a certain amount of initial cooperation in geographic areas for requests for the planning grants.

DR. CUMMINGS: That is correct. I would not relish the idea of receiving a large number of applications from a geographic area that didn't reflect, at least, some effort having been made to define the natural boundaries and service patterns. If we were to receive numbers of applications that were oriented to the very small regional concepts, we would probably take the cowardly position and discard them all and ask them to get together again to figure out some way for a larger area to be served.

Unlike the opportunities which are enjoyed by the regional medical programs which forecast something like thirty or more regional activities, I can tell you that the resources that will be available to us will provide only for the support of some eight or ten regional medical library centers. Quite frankly, I'm not sure the nation needs more than this number. I would be hopeful that subsequent meetings would lean towards suggestions as to how four or five or six states would attack the problem rather than having four or five or six independent propositions. In this area we would be extremely eager, of course, to see Alaska covered by whatever plan is submitted. I encourage the idea of some kind of regional planning on the most representative basis. I would hope it would include representatives of the user communities.

If I tried to influence you in any way in how to proceed to develop your plans, I would urge you to have some representation from practitioners, educators, and scientists, working with the library specialists. The National Library of Medicine will entertain planning grant applications. We don't think you should take money out of your pocket to plan a national service. I think it is our responsibility to provide the planning money to allow you to collect data and survey the needs and to structure your plan. The best investment we could make would be to give you some resources to plan well rather than to commit ourselves to give you a quarter of a million dollars to start a program that is ill-conceived.

MR. MILCZEWSKI: It seems to me there are perhaps three different things that need to be done. First of all, we need to develop a proposal for a regional plan, or at least a study of what the region's needs are, and how these might be solved. Then we need to bring this group back together again when that study is prepared, to discuss it to see whether this is really representative, whether this represents all of the facts and whether the proposals for solving the problems that we see really are the ones that should be made or whether they should be altered. There may be some other studies that should be carried on concurrently.

Perhaps these may be subsidiary studies of this larger planning effort. In the meantime there seem to me some real needs that we already see for improving existing services. I think these can be accommodated within the Medical Library Assistance Act, if I am correct, in improving collections and services, and training of librarians, to do what Dr. Kuharic, and others, see as a need to provide the personnel to do the job. I am reasonably certain that the University of Washington through the facilities it has, and particularly with the cooperation of the Health Sciences Library, and the library, could put together a proposal for a grant under the regional medical library grant program or some other to develop what we have been talking about.

This would not really commit either the National Library of Medicine or the University to provide a specific kind of regional service, and that is about all, I guess, I could say about that, and I would proceed on this basis unless you tell me I shouldn't, because you may feel that there are other better ways of getting at this. I wasn't sure what would come out of this conference so I am not setting before you a predetermined plan of action at all. It's just something that has derived naturally, I think, from the meetings that have taken place.

May I ask Dr. Cummings, if in his thinking this is to include all the 50 states and whether this group here should not include the needs of Hawaii?

DR. CUMMINGS: This question has been raised in another context. The question of whether Hawaii can best be served by a California library or some base in the Pacific Northwest is difficult to answer now.

I would be personally very much interested in the eastern extension of your interests. To me this represents, I think, the more difficult boundary to establish. Just in informal gatherings I have learned things I never dreamed existed, for example, that Montana has an east-west axis so that depending on what part of the state you are in, you either look to Minneapolis or Seattle. This is what I am anxious to find out, what is this natural boundary that divides Montana? We can draw boxes in Washington and put states in regions, but I think that would be a pretty stupid approach on our part. You have to know what your natural affinities are. These judgments cannot arbitrarily be made in Bethesda.

MR. MILCZEWSKI: One of the things that concerns me is the time element here. Obviously it would be best if we had a program of action now, but we don't have, and it would seem to be an error to proceed so rapidly that we get complaints. When the long-term needs are so vast, we shouldn't make mistakes.

DR. CUMMINGS: I can relieve you to some extent by telling you we don't intend to make funds available within the next year for the support of these regional libraries. We do intend to make funds available during the next year for the planning and data collection. Now if you feel you are going to lose out by virtue of time, this is not the case. There will be no head start for one area over another.

MR. MILCZEWSKI: This is a possibility, of course, but I really wasn't feeling the danger of losing out on anything. I was thinking of the needs of the health sciences users. They have been waiting for a long time, and how rapidly should we proceed. But perhaps they, too, can wait another year.

Q: Are you planning on having a MEDLARS installation here at the university?

MR. MILCZEWSKI: I think this really ties in with the regional medical library service concept, to some extent. We have talked with representatives of the National Library of Medicine about establishing a MEDLARS station. We have not made formal application in the sense of a grant application, and I think the determination for the best place of this is going to have to be the National Library of Medicine's. I may be giving the National Library of Medicine a responsibility for the choice it may not want, but it has to make it anyway.

DR. CUMMINGS: I think the question is an important one. Every regional medical library will contain a MEDLARS center, but not every MEDLARS center will be a regional center library.

MR. MILCZEWSKI: This is a good clarification. We now seem to have reached the stage where I'm the only one who seems to be doing the talking. We will proceed along the lines that we have suggested for some action. We will expect to draw you in at another stage to see really what direction we should be taking and how we should be doing it.

This has been a most important meeting as far as I am concerned. I am involved in other meetings with librarians, usually just librarians, and it is rare that one gets the kind of grouping that we have in this room.

I hope that we can get together again and to continue our discussion at another time.

I want to thank the speakers who came from a distance, Miss Annan, Dr. Cummings, Miss Darling, Miss Keenan, as well as Professor Kroll of this campus, and I want to thank all of you who were willing to participate in this group.

There are some other thanks that are due, too, to Mr. Oppenheimer for making most of the arrangements, to Mr. Allen for being behind the scenes and being responsible for physical details, to our own library staff for giving support in a variety of ways.

They will be thanked by me as Director. I am sure you would want me to extend your thanks too, and I will do so, unless you tell me not to.

We now have drawn to a close. Thank you all.

CONCLUSION

The participants of this conference came away with the conviction that the direct confrontation, at a planning, or even talking session, of users and distributors of information had been long overdue. Both groups found it necessary to inspect their beliefs critically. Has the library been sufficiently imaginative in anticipating legitimate wants? Has it been receptive to expressions of new needs? Or, are there services which indeed call for development, but by an institution other than the library? Are there theoretical and practical justifications for either including in or excluding from medical library programs such elements as expert advice, referral service, automatic selective dissemination of information programs, evaluated prepackaged condensation of articles on research, procedures, and therapy, material for continuing education efforts?

The organizers of the conference were encouraged by the favorable reaction of all participants to continue their efforts for a reopening of the dialogue in the future. Before such a meeting can be called, however, some steps must be taken to gain greater insight, particularly into the nature of existing information needs, and of problems unique to this area, e.g., the great distances, widely separated nodal points for a possible network and scarcity of resource libraries. The organizers of the conference then agreed to proceed, in consultation with an expert group, to this next step--the determination of how to elicit such information and the identification of those methods which would appear to be most fruitful--whether questionnaires, interviews, the testing of expanded services in an experimental situation or a combination of such devices. If this can be accomplished, a significant step in the development of a regional medical library service will have been taken.